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THE NIMBUS 6 DATA CATALOG
VOLUME 1

12 JUNE 1975 THROUGH 31 AUGUST 1975
DATA ORBITS 1 THROUGH 1082

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THE NIMBUS 6 DATA CATALOG

Volume 1

12 June 1975 through 31 August 1975
Data Orbits 1 through 1082

Prepared by

Management and Technical Services Company
Beltsville, Maryland

For the

Landsat/Nimbus Project

November 1975

GODDARD SPACE FLIGHT CENTER
Greenbelt, Maryland

FOREWORD

This is the first volume of a series of catalogs to be published by the National Aeronautics and Space Administration to document data acquired from the Nimbus 6 meteorological satellite. This volume covers the period from 12 June 1975 through 31 August 1975. Subsequent catalogs will contain documentation for succeeding periods throughout the useful lifetime of Nimbus 6.

Background information concerning the Nimbus 6 meteorological satellite system and a description of the experiments and data formats has been published separately in The Nimbus 6 User's Guide. Post-launch User's Guide information changes and corrections are included in the data catalogs. The Nimbus 6 catalogs present the type of data available, anomalies in the data, if any, and geographic location and time of the data.

The assembly and editing of this catalog was accomplished by the Management and Technical Services Company (MATSCO), Beltsville, Maryland, under contract number NAS5-20694 with the Goddard Space Flight Center, NASA, Greenbelt, Maryland.

D. Fordyce
Project Manager
Landsat/Nimbus Project
Goddard Space Flight Center

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SECTION 1

SUMMARY OF OPERATIONS

1.1 Introduction

Nimbus 6 was successfully launched from the Western Test Range, Vandenberg Air Force Base, California at 08 hr. 12 min. 00 sec. GMT on 12 June 1975. The orbit was nearly circular at 1093 km × 1105 km. Satellite operations from launch through 14 July (orbit 425) consisted of engineering evaluation of all spacecraft systems. As a result of that effort, data reception, accountability and processing were intermittent during that period. Therefore, this catalog mainly reflects documentation from orbit 426 (14 July) through orbit 1082 (31 August).

Because the spacecraft power output is limited, all experiments are not on at the same time. During this catalog period two on-off mode sets were used for the experiments. These two modes are shown in Table 1-1. Occasionally, these modes were modified for a few orbits because of special experiment requirements. The on-off mode for each orbit is shown in Table 2-2 in Section 2 of this catalog.

Table 1-1

Programmed On-Off Modes for the Nimbus 6 Experiments

Experiment	PMR	THIR	HIRS	SCAMS	TWERLE	ERB	ESMR	T&DRE	LRIR
Mode 1	ON	ON	ON	ON	50%	ON	OFF	OFF	ON
Mode 2	ON	ON	ON	ON	50%	OFF	ON	OFF	OFF

Because of an anomaly in the functioning of the High Data Range Storage Subsystem (HDRSS) B, first noted during orbit 33 (14 June), HDRSS B has been limited to 65 minutes of record capability (out of a possible 120 minutes). With only HDRSS A available for full-time use, there are occasional periods when global experiment coverage is not obtained. (These occur when the Orroral, Australia STDN station is not available for playback of recorded experiment data.) The areas not covered are usually over the western part of the Pacific Ocean and/or the eastern part of the Atlantic Ocean. Table 2-2 lists the record time for each HDRSS, and Section 2 provides a method for determining the time and location of coverage from each experiment.

Subsections 1.2 through 1.10 of this catalog summarize the operational highlights of the individual experiments, present preliminary experiment results, and call attention to known data anomalies. Section 2 lists the on-off times for each experiment, and provides a method for determining the geographical coverage of each experiment. Section 3 shows selected HIRS, SCAMS and ESMR images, and Section 4 presents THIR montages. Section 5 presents corrections to The Nimbus 6 User's Guide.

The user is referred to The Nimbus 6 User's Guide for a complete description of each experiment and to Section 1.7 of that Guide for the requesting procedure and sources for all data. Sections 2, 3 and 4 of this Data Catalog should help users select data to meet their needs.

1.2 The Temperature Humidity Infrared Radiometer (THIR) Subsystem

The quality of the THIR data from both channels (11.5 μm and 6.7 μm) and telemetry have been good since launch. All processed THIR film is archived and available through the National Space Science Data Center, as is all available THIR digital data. The THIR digital products are processed to final format only on request. Users should refer to Section 4 of this catalog, and to Sections 1.7 and 2.4 of The Nimbus 6 User's Guide for a discussion of the formats and procedure to order these products.

1.3 The High Resolution Infrared Radiation Sounder (HIRS) Experiment

The HIRS filter/chopper mechanism has a 5:1 "sun planet" gear arrangement built into it. Mechanical resonance in this system has caused (since well before launch) a 5 Hz oscillation in the integrate times of all channels. The amplitude of the resonance has increased since launch, and at the end of this catalog period was sufficiently large sometimes to upset the format of the bit stream generated by the instrument. The format is upset because the timing of the bit stream is controlled by the rotation of the filter/chopper wheel. The 5 Hz effect has been effectively controlled by averaging the significantly affected data across five fields of view. This procedure entirely removes the 5 Hz signal, but does cause degradation in horizontal resolution across the subsatellite track by a factor of five.

Large day-night differences in earth radiance have been observed for channels 14 and 15. The difference is real (not due to instrumental miscalibration or to scattered light in the instrument) and amounts, at most, to about 20 percent of the nighttime radiance in channel 15, and about 10 percent in channel 14. The difference, expressed as a brightness temperature, is about 3°K maximum in channel 14 and 6°K maximum in channel 15. These differences appear to be due to atmosphere fluorescence in sunlight at the wavenumbers of channels 14 and 15 (2275 cm^{-1} and 2357 cm^{-1}). On this assumption, an empirical algorithm has been derived to represent the fluorescent emission. The algorithm is of the form:

$$R = a \cos \alpha$$

where α is the solar zenith angle at the target point on the earth's surface and a is a constant (0. 045 mw for channel 15, and 0. 0124 mw for channel 14). Efforts to find a more appropriate algorithm are in progress.

1.4 The Scanning Microwave Spectrometer (SCAMS) Experiment

The spectrometer has five channels, at 22. 23, 31. 65, 52. 85, 53. 85, and 55. 45 GHz. These channels are designated 1 through 5, respectively. SCAMS was initially turned on during orbit 46 (15 June), then turned off during orbit 56. It was turned on again during orbit 112 (20 June). During the week of 29 June - 5 July channel 5 became intermittent; but by 11 July this problem had spontaneously disappeared and channel 5 was subsequently stable. Gain on channel 4 decreased approximately 15 percent during the first two months after launch. However, the calibration system allows the radiometer to be accurately calibrated in spite of this loss of gain. The other channels and the scan mechanism operated without problems.

SCAMS images are an output product of the SCAMS data processing. Details of the image format and image examples are shown in Section 3 of this catalog and in Section 4 of The Nimbus 6 User's Guide. Figure 1-1 is an example, showing several features of scientific interest. Most interesting perhaps is the detailed structure of the Antarctic ice cap shown in the parameter 16 map (image column 3). (Parameter 16 is the difference in antenna temperature between channel 2 and channel 1.) There is considerable difference between the ice shelf at east and west longitudes, the dark ice corresponding to a frequency-independent emissivity and the light ice corresponding to an emissivity increasing with wavelength. The latter ice presumably scatters better at shorter wavelengths and has a lower brine content. On mainland Antarctica there are unexpected additional features that bear no simple relationship to emissivity or land elevation, but relate to large-scale variations of snow and ice properties. Over ocean, dark values of parameter 16 generally correspond to dry air.

Parameter 11 (integrated atmospheric water vapor from channel 1 data) clearly shows moist bands of oceanic air in the tropics intermixed with drier bands. Since these maps represent a response to water vapor in the bottom few kilometers of the atmosphere, they are quite different from infrared or other maps of global humidity patterns.

Parameter 12 (integrated atmospheric liquid water from channel 2 data) demonstrates the ability of SCAMS to separate rather clearly the estimates of liquid water (dark) from the water vapor features evident for parameter 11. The very long, well-defined bands of precipitation are also evident in ESMR displays for Nimbus 5 and Nimbus 6, although they may be confused with the water vapor distribution in these displays.

The effects of large precipitation cells on these uncorrected temperature maps can be seen near N08, W144 in the parameter 13 (average temperature of the 1000 mb

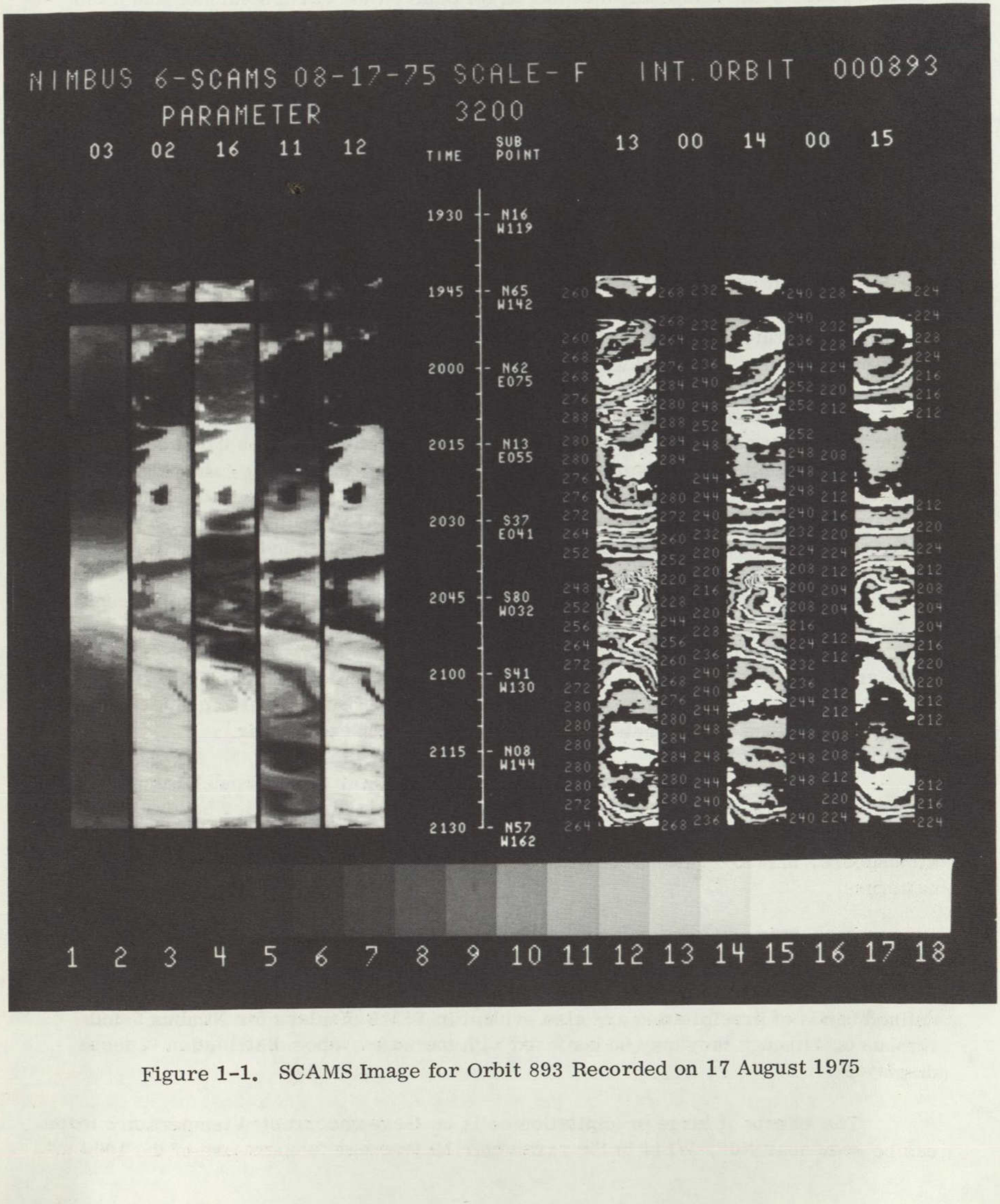


Figure 1-1. SCAMS Image for Orbit 893 Recorded on 17 August 1975

to 500 mb layer) and parameter 14 (average temperature of the 500 mb to 250 mb layer) maps where the Intertropical Convergence Zone crosses the 284°K and 248°K contours, respectively. The intense precipitation zone nearby at S41 produces no obvious effect in the map, presumably because the freezing level occurs at lower altitudes there than at the equator. The effects of high elevation land, uncompensated in these displays, are clearly evident over Antarctica. The effects of surfaces are evident for parameter 13 near Madagascar, where the present unsophisticated program does not compensate completely for surface emissivity. All three temperature maps show interesting meteorological features.

Post-launch information on space and target antenna calibration are in Section 5, along with SCAMS corrections to The Nimbus 6 User's Guide.

1.5 The Electrically Scanning Microwave Radiometer (ESMR) Experiment

The performance of the ESMR has been good since launch. A preliminary post-launch calibration has been completed and routine data processing is under way. The data tapes are being saved until the corresponding definitive ephemeris tapes are available at which time the data tapes are processed. Waiting for the ephemeris tapes cause data processing to run approximately two weeks behind real-time data receipt.

Among the beam positions, the apparent relative accuracy is about ±5°K for the horizontal polarization and ±3°K for the vertical polarization. Greater accuracy will be attained when the instrument is left on for an extended period of time and a stable thermal regime is established.

Information on the ESMR image format and information content appears in Section 3, and ESMR corrections to The Nimbus 6 User's Guide in Section 5 of this catalog.

1.6 The Earth Radiation Budget (ERB) Experiment

The ERB began its first two-day period of operation during orbit 271 on 2 July 1975, and continued to operate on a 50 percent duty cycle of two days on two days off throughout July and August. The instrument performance and data quality were excellent during this period, with relatively minor discrepancies beginning to appear on 19 August. At that time, the indications of scan head alpha-angle began to appear erratic, but they were explained by bit droppage from the alpha encoder. This bit droppage followed a very consistent pattern so that the erroneous indications could be easily corrected. Later, on 30 August during orbits 1066-1069, the monitors of the PRP (photo reference pickup) and chopper operation indicated drop-outs in scan channel signals during three short segments of each scan pattern. This discrepancy caused a loss of approximately 10 percent of the data from the scanning channels during those four orbits. These discrepancies disappeared when the ERB was placed in the Scan-OFF mode on 31 August. Therefore, the ERB was set to operate in the Scan-OFF (nadir viewing) mode pending investigation of the PRP problem.

The stability of the solar channels is shown in Table 1-2. Listed are the monthly means and maximum deviations from the mean of the observed solar irradiances in watts per square meter, normalized to the mean sun-earth distance. Some of the variation in channels 9 and 10 is introduced during the ERB scanning sequence as the gimbal slews from the aft to the forward direction. Some of these variations may be corrected after resolving data reduction problems presently under investigation.

Table 1-2

Characteristics of the ERB Solar Channels and the Monthly Means and Variation of Solar Irradiance

Ch. No.	Spectral Interval (μm)	Sensitivity ($w \cdot m^{-2} \cdot ct^{-1}$)	STC[4]	July Mean	July Maximum Deviation (% of Mean)	August Mean	August Maximum Deviation (% of Mean)
1	0.18-3.8	1.272	0.09	1368.2[1]	±0.1	1369.0[2]	-
2	0.18-3.8	1.310	0.10	1365.8	±0.3	1355.7	±0.2
3	<0.2->50	1.227	0.09	1392.1	±0.03	1391.7	±0.1
4	0.526-2.8	1.822	0.05	969.2	±0.1	967.8	±0.2
5	0.698-2.8	2.525	0.07	675.9	±0.4	678.9	±0.2
6	0.395-0.508	7.745	0.04	205.9	±0.2	205.0	±0.2
7	0.344-0.460	9.789	0.09	164.7	±1.0	160.7	±0.9
8	0.300-0.410	12.60	-0.03	109.2	±0.7	107.5	±0.8
9	0.275-0.360	33.12	-0.14	57.09[3]	±0.5	56.53[3]	±0.4
10	0.252-0.324	51.98	-0.15	26.97[3]	±0.6	26.95[3]	±0.6

[1]Based on two observations on dates 7/2 and 7/29.

[2]A single observation on 8/19.

[3]These values are about 4 percent and 12 percent high for channels 9 and 10, respectively, and will be corrected when the temperature dependence of the zero-level signal is determined.

[4]STC is the sensitivity temperature coefficient (percent per degree celsius). The sensitivity, S_T, at temperature T(°C) is given by $S_T = S_0 [1+(0.01) \cdot (T-25) \cdot STC]$, where S_0 is the sensitivity at 25°C as given in Table 1-2.

The mean solar irradiances shown in Table 1-2 were derived from data obtained when the instrument temperature had stabilized. With the instrument heat radiators always fully opened, as they were during July and August, the instrument temperatures stabilized after about 12 hours of operation.

The solar channels show negligible noise levels (less than 0.1 percent) except channels 8 and 10, which are affected by the slewing of the scan head. The scanning process introduces about 1.5 percent error in the worst case (when the noise spike occurs within the selected zero reference time, or within one minute of the sun-on-axis time).

The noise levels of the wide-angle total earth flux channels 11 and 12, are inseparable from the signal in the normal mode of operation. The combined effects of noise and calibration errors obtained with the sensors shuttered indicate that the shutter temperature derived from the channel signal agrees with the temperature derived from a thermister with an average difference of 1°C, and a standard deviation of 3°C. Channels 13 and 14 have standard deviations (in counts) of 3 and 15, respectively, over the dark FOV's. The higher variation in the channel 14 signal is probably due to the scene variation in the $3 \mu m$ to $4 \mu m$ region.

The ERB scanning channels experience the highest noise levels. Tables 1-3 and 1-4 show the extent of the noise as measured with the scan head in a fixed position. The noise in the shortwave channels is expressed as the standard deviation of the signal in counts ($w\ m^{-2}\ sr^{-1}$), and as a percent of energy reflected by a 100 percent diffuse reflector ($\%A_0$). The noise in the longwave channels is expressed as the standard deviation of the signal in counts ($w\ m^{-2} sr^{-1}$), and as a percent of blackbody radiation from a 258°K blackbody (258° is the approximate average equivalent blackbody temperature of the earth as viewed from the satellite level). Microphonics is another form of noise introduced into the output of the scanning channels during the scanning sequence. For the shortwave channels, the standard deviation of the signal during dark FOV's is less than 2 percent of the energy received from a 100 percent diffuse reflector with the sun directly overhead. The microphonic contribution in the longwave channels is less than 4 percent of the radiation (in the spectral interval $5.0 \mu m$ to $50 \mu m$) from a 258°K blackbody. Since the scanning channel radiances are averaged over many samples for any given target area, these noise levels become negligible.

Information about instrument calibration as well as corrections to The Nimbus 6 User's Guide appears in Section 5.

1.7 The Limb Radiance Inversion Radiometer (LRIR) Experiment

The explosive squibs were fired to vent the solid methane, ammonia, and vacuum shell on orbits 4, 31 and 19 respectively. The LRIR was turned on and commanded to adaptive scan during orbit 34 (14 July).

Table 1-3

Noise Levels in ERB Shortwave Scanning Channels
(Viewing the internal blackbody)

Ch	σ (counts)	σ ($w \cdot m^2 \cdot sr^{-1}$)	$\%A_o$
15	2.9	0.9	0.2
16	3.2	1.0	0.2
17	2.7	0.9	0.2
18	5.5	1.9	0.4

($A_o = 435\ w\ m^{-2}\ sr^{-1}$)

Table 1-4

Noise Levels in ERB Longwave Scanning Channels
(from fixed space view)

Ch	σ (counts)	σ ($w \cdot m^{-2}\ sr^{-1}$)	% of 258°K BB Rad.
19	10.0	1.0	1.8
20	11.4	1.2	2.2
21	9.6	1.0	1.8
22	7.9	0.8	1.4

(258°K = $55.4\ w\ m^{-2} sr^{-1}$)

Instrument operation has been nearly nominal since then. All optics and electronics temperatures have been within expected ranges. The detector temperature initially dropped to 63.6°K as the cooler temperatures stabilized. This low value led to channel 2 saturation during calibration cycles over a part of the orbit for the first few weeks, but no trouble is expected in reconstructing the calibration during those times.

As the detector temperature has risen from 63.6°K to 64.35°K, there has been a slow decrease in sensitivity noted in channels 1, 2, and 4. Data quality appears very good.

After several hundred orbits, a degradation of the shaft encoder is causing the loss of approximately 25 percent of the data. With this exception, the LRIR performance has been excellent. The thermal stability, as noted above, has been as expected. The reference blackbody temperature has remained constant.

Initial studies have verified the transmittance models for the carbon dioxide and ozone channels, verified certain aspects of instrument performance, and developed preliminary techniques for removing some optical cross talk between channels. Initial retrievals for temperature and ozone agree well with simultaneous supporting measurements. Water vapor is now being studied.

The development of software is proceeding well. The initial stage, to generate Radiance Archive Tapes, is beginning to run operationally. The second stage, the operational inversion routines, are now being checked out in detail. The final stage, which does objective mapping of the data, will be checked when second stage results are available.

1.8 The Pressure Modulator Radiometer (PMR) Experiment

The PMR was turned on for one day on 16 June 1975, and has been on permanently since 20 June. Different combinations of scan or vertical view and the various sieve settings were used during the first few days to check performance. Since then both PMR channels normally have been kept in the scan mode with channel 1 in sieve setting 0 (0.61 mb cell pressure) and channel 2 in setting 1 (0.64 mb cell pressure). This combination gives a particularly useful set of weighting functions, and it is intended that it will be used at least on alternate days during periods when other sieve combinations are used.

Channel 2 was set in sieve 4 (4.3 mb of CO_2 in the cell) in vertical view on 20 August for one day for comparison with the Nimbus 5 Selective Chopper Radiometer channel B12, since they have similar weighting functions. The comparison showed similar results, except that the PMR was consistently 4°C hotter. This is well within error attributable to different weighting functions. PMR channel 2 in sieve 1 at the ends of the scan also has a similar weighting function to SCR channel B12. Comparison of these data have shown temperature differences of much less than 4°C.

Telemetry indicates that the position of the calibration mirror has been erratic during certain parts of the orbit. This is attributed to sunlight scattered into the instrument by parts of the spacecraft, which affects the photocells indicating mirror position. However, there is sufficient redundant information to determine the mirror position and this fault causes no loss of data.

A small number of noise spikes have been observed in the signal channel data, particularly on channel 1. These are believed to be due to the South Atlantic Anomaly, and cause no significant loss of accuracy or information.

The operations of the instrument have been very stable during the first two months of operation and have not changed significantly in any respect. Detector noise is unchanged from before launch. Noise values for one second integration times for channels one and two are 3.7 and 2.4 mw/m^2 ster cm^{-1} rms, respectively.

Figure 1-2 shows a typical scan together with a symmetric orthogonal polynomial fit. The scan is not symmetrical about zero scan angle because the spacecraft had a pitch offset of about one degree. Radiation at the scan center originated in the upper mesosphere and therefore, is lower than the radiation at the scan ends, which originated near the stratopause. Figure 1-3 shows the variety of scans observed. The scan differences are due to the atmospheric temperature structure and different cell pressures for each measurement. The crosses indicate the quantity of information present in each scan. Figure 1-4 gives the preliminary weighting functions appropriate to the data shown on the maps in Figures 1-5 through 1-7. These functions are for the bottom, middle, and top of the height range obtained with channels 1 and 2 scanning in sieve settings 0 and 1, respectively. Figure 1-5 (for the layer from approximately 42 km to 55 km) shows a warm polar cap in the Southern Hemisphere with the highest temperature at 180°W, 70°S, but with the warm region also extending toward 30°W. The pattern was very similar at the higher level shown in Figure 1-6 (≈47 km to 73 km layer), but the warm maxima at 30°W and 180°W are now of equal temperature. At the top level shown in Figure 1-7 (≈77 km to 97 km) the warm region was at 60°W, 75°S, indicating a westward tilt of the temperature anomaly in the 30°W to 50°W region in the upper mesosphere.

It is significant that the instrument does not appear to see large amplitude waves often observed by rocketsondes. This is not surprising, since rocketsounde measurements have vertical wavelengths that are short compared with the vertical averaging of 10 km to 20 km layers from the PMR. It is also likely that the rocketsonde measurements have horizontal distance scales that are short compared with the size of the field of view. The vertical averaging procedure using PMR data should be more accurate, since the atmospheric "noise" from the rocketsonde measurements would increase the sampling error.

Differences of up to 5°C between the daytime and nighttime zonal means are currently being found at the top atmospheric level, but it is not yet clear whether they are atmospheric or instrumental in origin (corrections are not yet being made for the effects of instrument temperature variation around the orbit). These day-night differences were taken into account when making the analyses shown in Figures 1-5 through 1-7.

Temperature variations from place to place have generally been less at the top atmospheric level that at stratopause levels (e.g. compare Figures 1-5 and 1-7), although no large sudden warmings in which behavior may be quite different have occurred since launch.

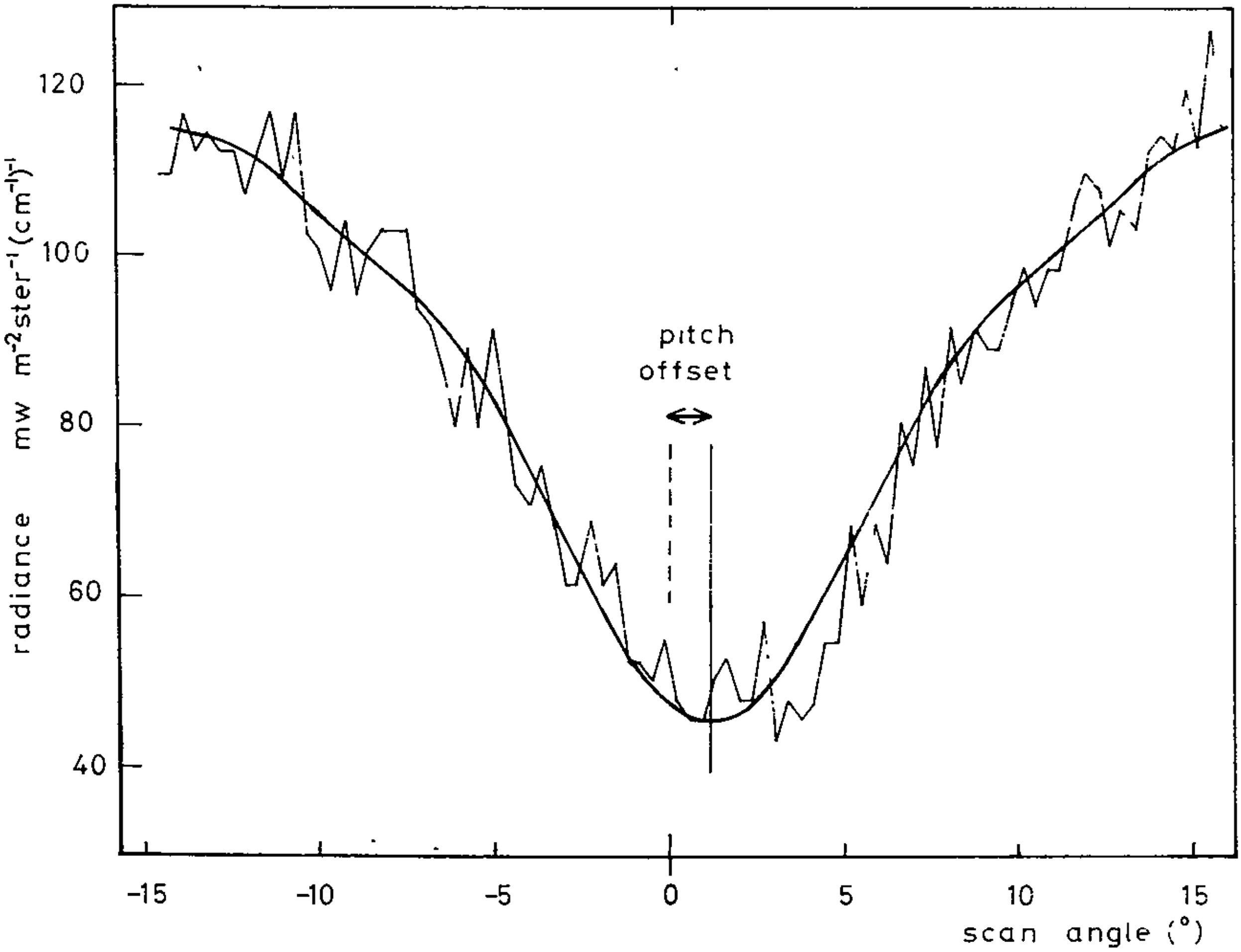


Figure 1-2. PMR Scan Recorded on 30 June 1975 Showing a Typical Scan for Channel 1 in Molecular Sieve Setting 0 (0.61 mb cell pressure). This scan was centered at 79°N, 175°W.

The PMR experiment is described in greater detail in The Nimbus 6 User's Guide and in Proceedings of the Royal Society of London, Vol. 337, 1974, pp. 135-150.

1.9 The Tropical Wind Energy Conversion and Reference Level Experiment (TWERLE)

The TWERLE was initially turned on during orbit 21 (13 June). Since then it has operated during the daylight portion of almost all orbits and during a part of most nighttime orbits. By the end of this catalog period over 250 platforms had been activated, including balloons, buoys, and reference platforms. Buoys and fixed platforms have been deployed from the South Pole to the Beaufort Sea. TWERLE balloons are being tracked and are transmitting height and temperature information. Up to 20 messages have been received from one platform during a single orbit. Preliminary results indicate that most reference platform determinations are within 1.5 kilometers of their true position.

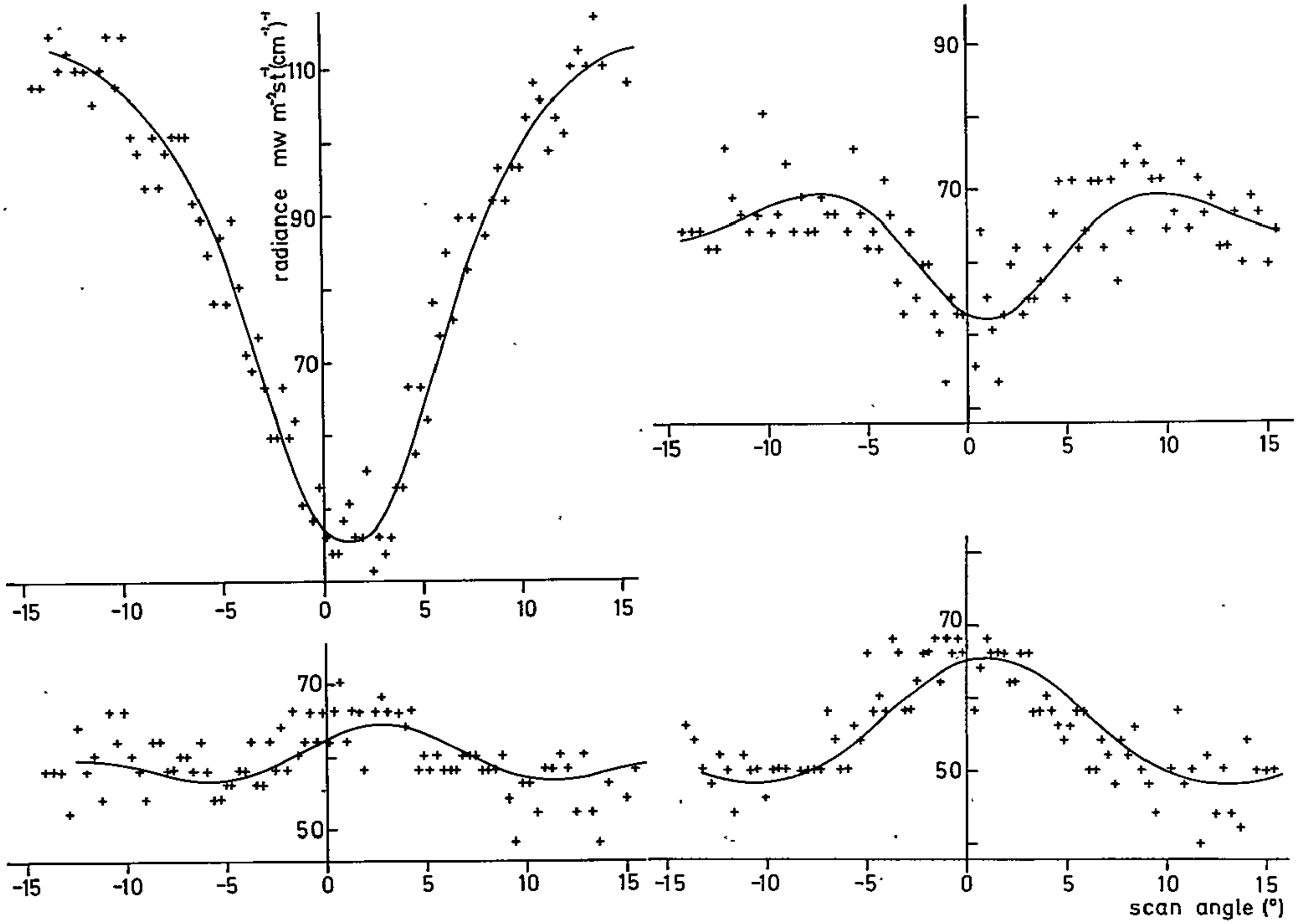


Figure 1-3. Different Types of PMR Scans. Crosses are the measured one-second values. The smooth lines are orthogonal polynomial fits.

Section 5.8 of this catalog contains the address corrections for the principal investigators listed in Table 9-2 (Nimbus RAMS Experiments) in The Nimbus 6 User's Guide. Anyone interested in results from a particular experiment should write to the principal investigator for that experiment.

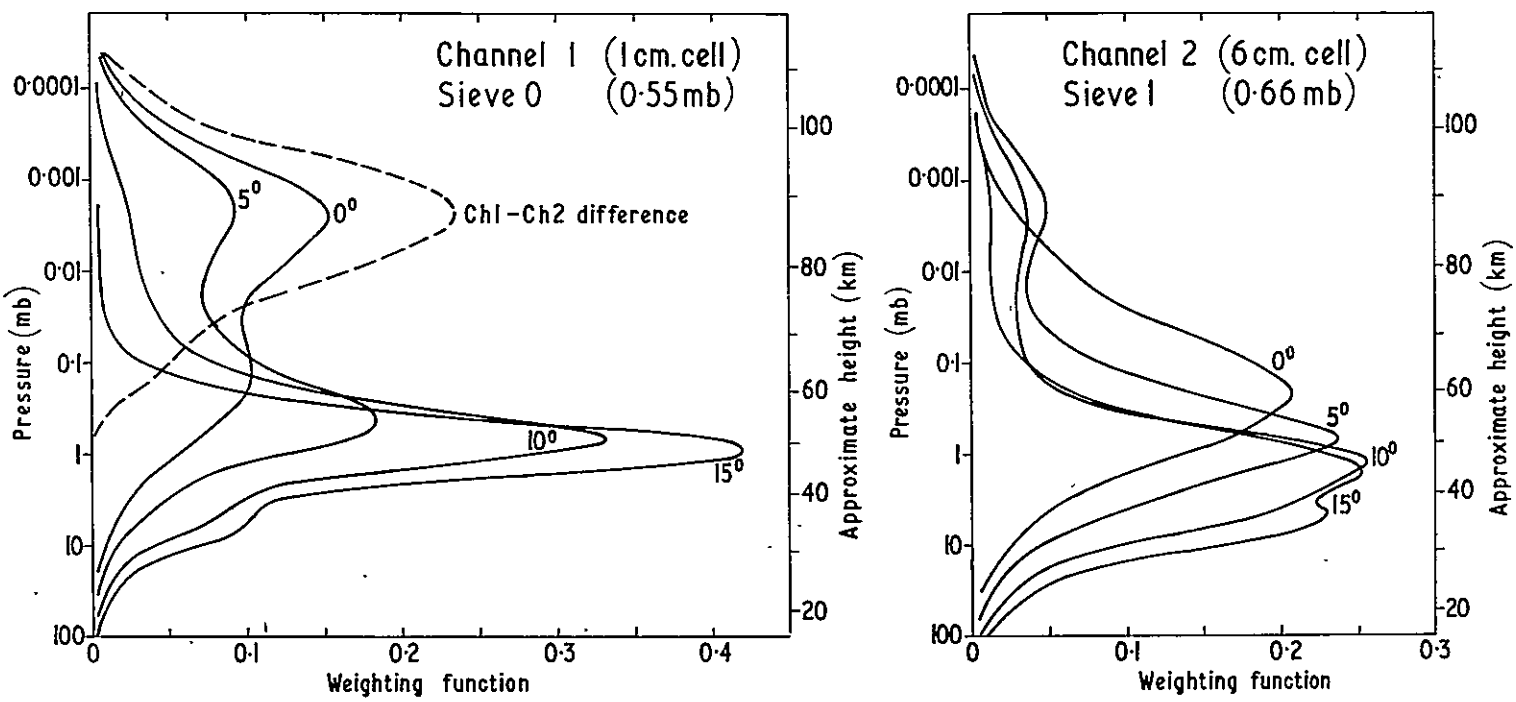


Figure 1-4. Weighting Functions for PMR channel 1 at Sieve Setting 0 (C1S0) and channel 2 at Sieve 1 (C2S1) at Scan Angles of 0°, 5°, 10°, and 15°. The dashed weighting function is a normalized difference between the two channels at zero scan angle: 1.67 C1S0 (minus) 0.67 C2S1.

1.10 The Tracking and Data Relay Experiment (T&DRE)

The T&DRE has been extensively evaluated since launch. In this experiment, tracking and telemetry data is relayed from NIMBUS 6 to a single ground station via the 24-hour earth-synchronous ("geostationary") ATS 6 spacecraft. The ground station currently being used is located at the NASA Madrid, Spain site. System performance for all modes of operation has, in all cases, met or exceeded design specifications. The T&DRE checkout phase has been successfully completed and experiment operations are underway. The significant accomplishments to date include:

- Demonstration of "no error" Nimbus 6 telemetry data relay including VIP, HIRS, and LRIR at 4 kbps, and THIR analog,

- Data Evaluation Mode (DEM) at 50 kbps through 400 kbps has been relayed at predicted bit error rates,

- Nimbus 6 antenna programmer commands via ATS 6 received and verified,

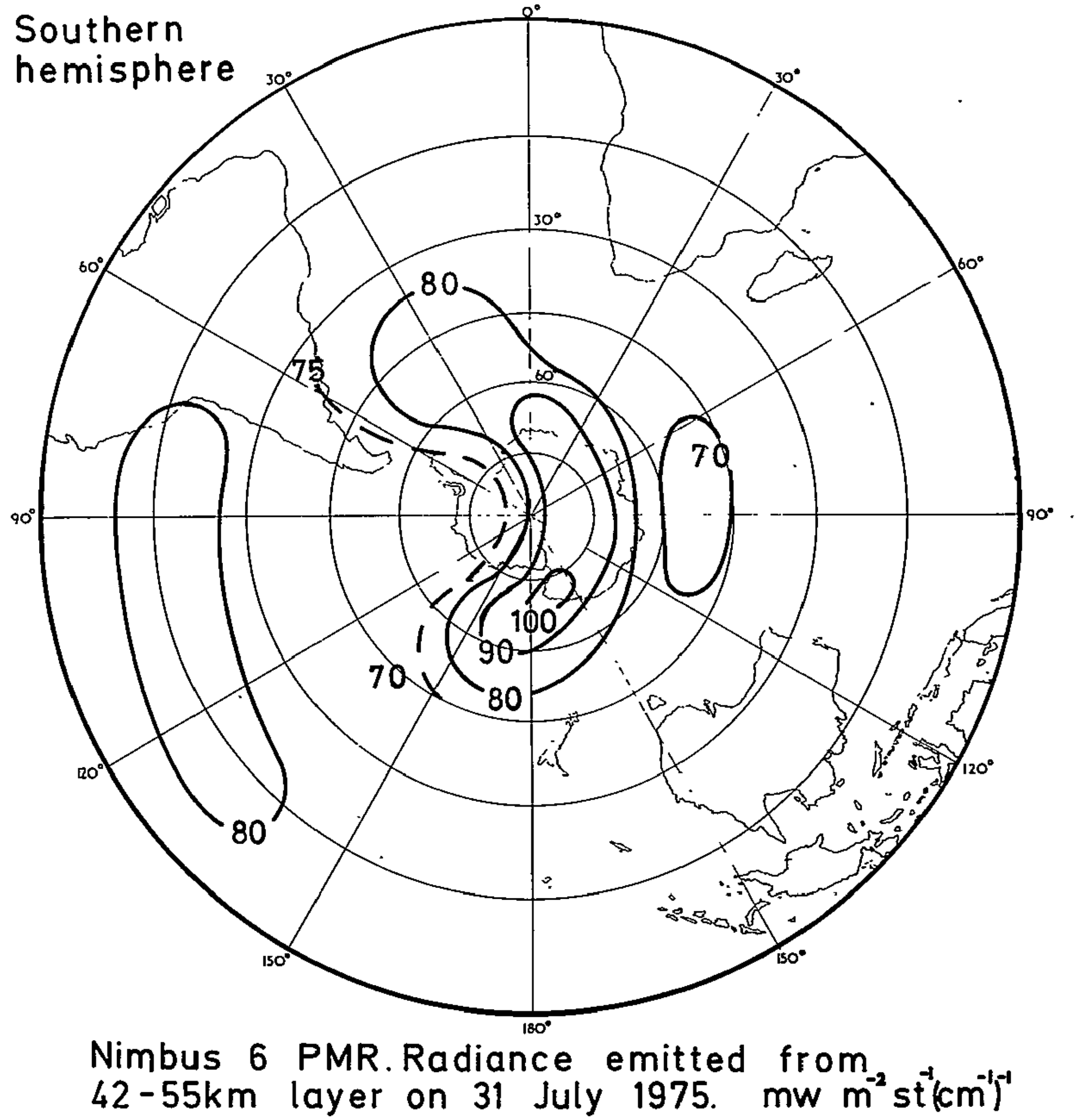
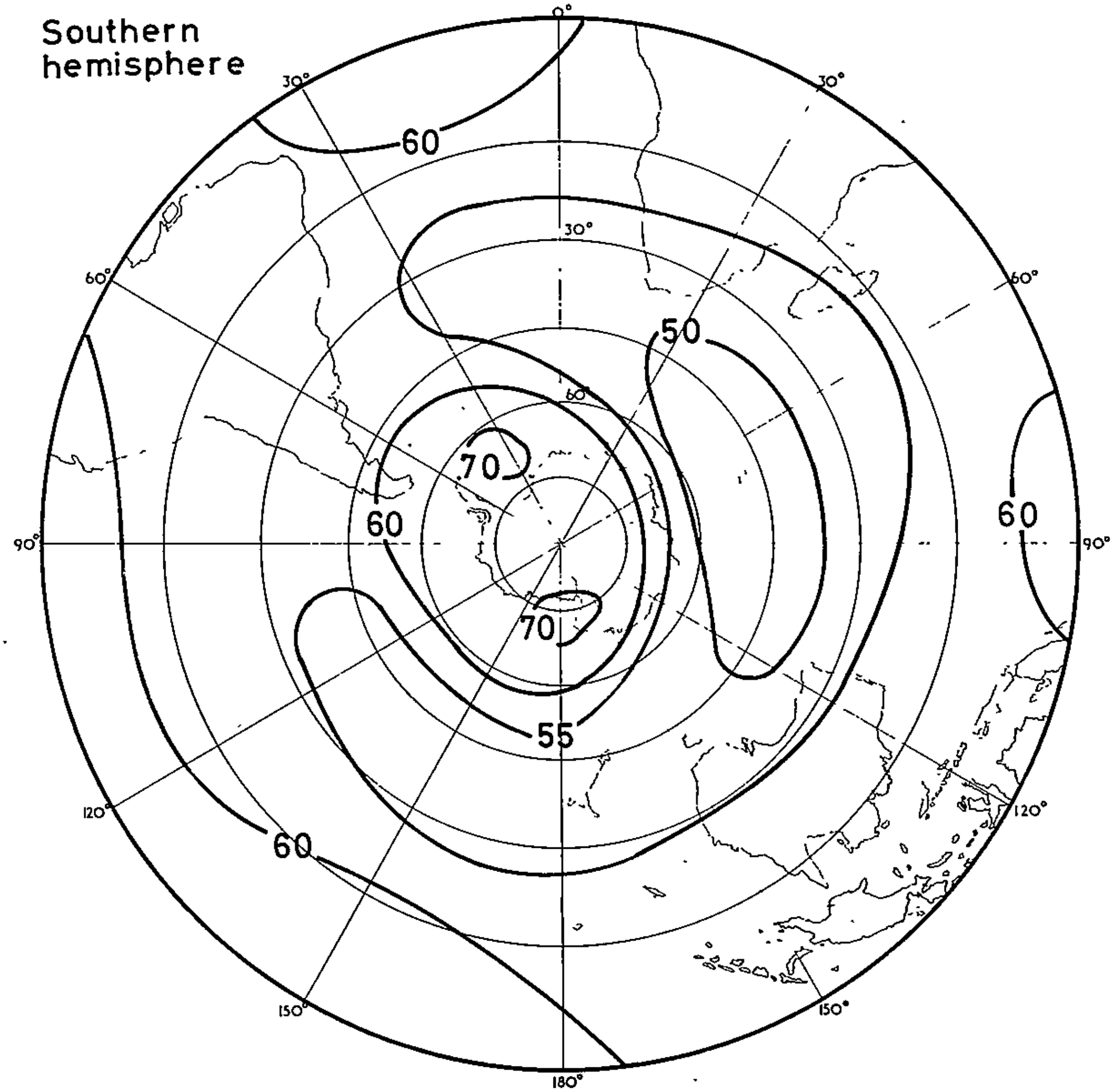


Figure 1-5. Southern Hemisphere Polar Stereographic Analysis for 31 July 1975 using PMR Measurements from the Ends of the Scan of channel 1 in Sieve Setting 0. (The C1S0 end-of-scan weighting function is the 15° scan angle shown in Figure 1-4.)

- Relay tracking of Nimbus 6 has been accomplished at the expected measurement resolution of 0.05 cm/sec in range rate and 2 meters in range,
- First Nimbus 6 satellite-to-satellite orbit determination performed using tracking data recorded on two successive Nimbus orbits,



Nimbus 6 PMR. Radiance emitted from the 47-73km layer on 31 July 1975. mw $m^{-2}st^{-1}(cm^{-1})^{-1}$

Figure 1-6. Southern Hemisphere Polar Stereographic Analysis for 31 July 1975 using PMR Measurements from the Scan Center of channel 2 in Sieve Setting 1. (The C2S1 center weighting function is the 0° scan angle shown in Figure 1-4.)

- New trilateration technique implemented for determining geostationary orbits using Nimbus 6 T&DRE hardware and software.

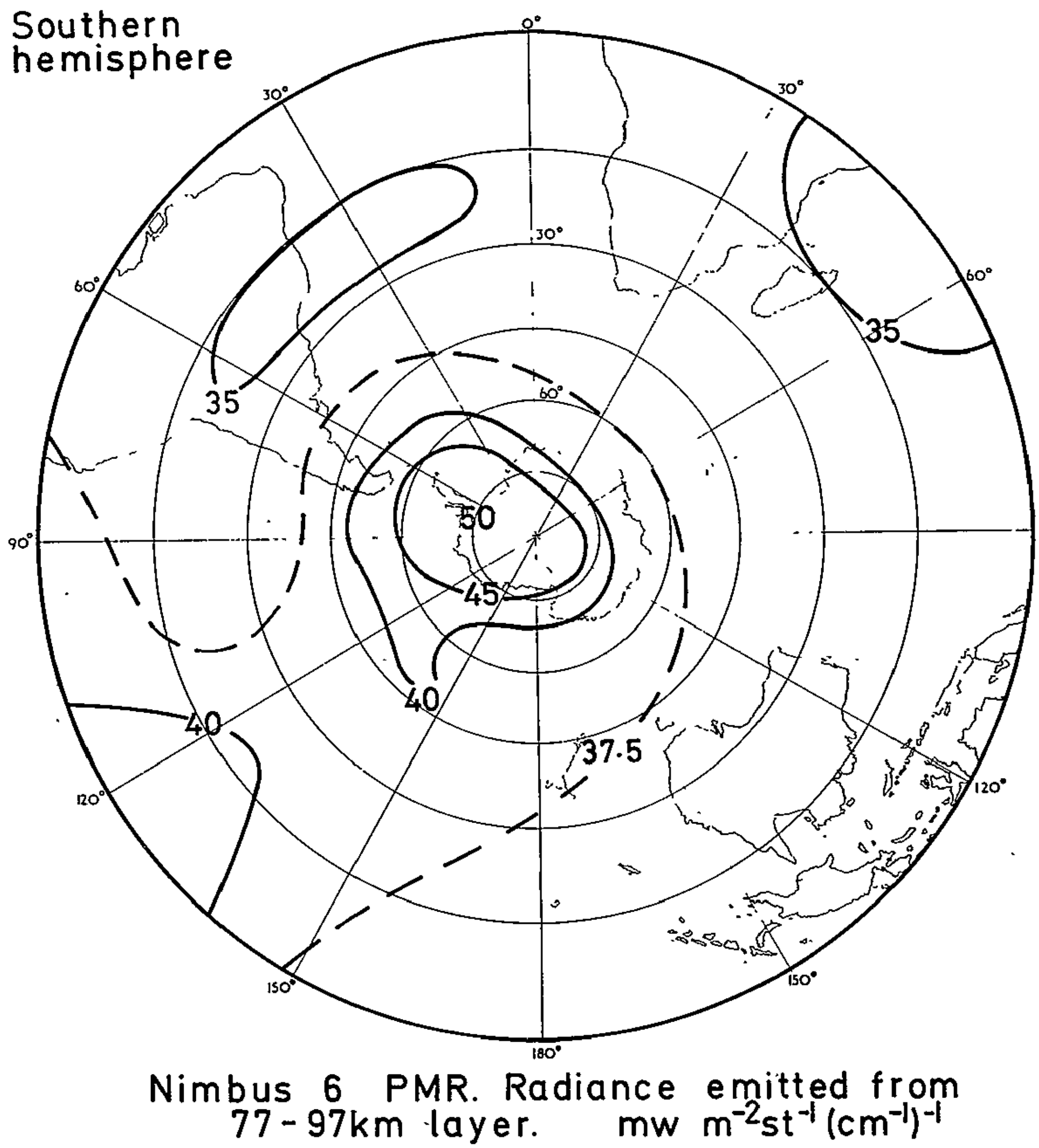


Figure 1-7. Southern Hemisphere Polar Stereographic Analysis for 31 July 1975 using a Normalized Difference between the Scan Centers of channel 1 Sieve 0 and channel 2 Sieve 1. (This difference is the dashed line shown in Figure 1-4.)

Nimbus 6 tracking has the advantage over previous satellite-to-satellite tracking in that the relatively high signal strength received at ATS 6 permits consistent range measurements independent of geometry. Determination of optimum mixing of range and range rate data for satellite-to-satellite tracking is one important aspect of the T&DRE directly applicable to the forthcoming Tracking & Data Relay Satellite (TDRSS). Also, the Nimbus 6 antenna design is such that atmospheric occultation will be readily observable, permitting evaluation of meteorological models of the earth's troposphere. The feasibility of such observations has already been demonstrated on a limited scale using ATS 6/Apollo Doppler data, where the Doppler signature at occultation reached the predicted level of 40 meters per second.

Future T&DRE tracking data will be extensively examined over the Indian Ocean gravitational anomaly and signatures compared with theoretical predictions. The possibility of improving Nimbus 6 reference orbits based on T&DRE tracking for use in conjunction with the Nimbus 6 TWERLE experiment is also being explored.

SECTION 2

THE ORBITAL ELEMENTS AND DATA AVAILABILITY ON-OFF TIMES

This section presents the Nimbus orbital elements for selected epochs, tabulates the time when each of the experiments was recording data, and gives procedures for determining the time and orbit when the satellite is over a given geographical area (and thus determining the location of coverage for each experiment).

The Nimbus 6 Brouwer Mean orbital elements for selected epochs during July and August 1975 are listed in Table 2-1. As the elements indicate, the orbital period is slowly increasing and the satellite is moving into a slightly higher orbit. This effect has been attributed to the thrust given by the solid methane and ammonia sublimating from the LRIR solid cooler. The effect on the orbit is the opposite of that caused by atmospheric drag. The elements listed in Table 2-1 do not account for this effect. When these elements are used more than seven days from epoch, location errors of more than 60 km (about ten seconds of time) can be expected. If more accurate ephemeris are needed for a specific time period, write to the Nimbus Project, Code 430, Goddard Space Flight Center, Greenbelt, Maryland 20771. It is anticipated that this effect will continue until the beginning of 1976, at which time the methane and ammonia will be completely depleted, no longer giving a thrust to the satellite.

The data availability on-off times, listed in Table 2-2, are the times when the data from each experiment was recorded on a HDRSS and processed through the Meteorological Data Handling System (MDHS) at Goddard Space Flight Center. The Table 2-2 header labels and their meaning are as follows:

INT ORBIT AND STDN

The satellite orbit number in progress when the satellite data is relayed to a ground station is called the interrogation orbit (INT ORBIT). The ground stations receiving the Nimbus 6 satellite data are part of the Spacecraft and Tracking Data Network (STDN). There are three STDN stations receiving Nimbus 6 experiment data: Fairbanks, Alaska (denoted by the letter "A"), Rosman, North Carolina (R), and Orroral, Australia (O).

HDRS

The HDRS (High Data Rate Storage System - HDRSS) is the acronym for the satellite tape recorder system. Recorder "A" or "B" (or both) is played back during each STDN station interrogation.

Table 2-1

Nimbus 6 Brouwer Mean Orbital Elements
for July and August 1975

Epoch	GMT	9 July 75 00 00 00	22 July 75 00 00 00	8 Aug 75 00 00 00	22 Aug 75 00 00 00
Semi-Major Axis	Km	7476.888	7477.307	7477.854	7478.306
Eccentricity		.000803	.000858	.000863	.000858
Inclination	Degrees	99.961	99.959	99.958	99.957
Argument of Perigee	Degrees	180.858	149.564	110.187	79.709
Right Ascension of Ascending Node	Degrees	102.756	115.571	132.320	146.109
Height of Perigee	Km	1092.72	1092.73	1093.23	1093.73
Height of Apogee	Km	1104.72	1105.6	1106.14	1106.55
Anomalistic Period	Minutes	107.23556	107.24457	107.25633	107.26605
Motion of Perigee	Deg. per Day	-2.4287	-2.4281	-2.4279	-2.4275

HDRS TIME ON-OFF

The HDRSS ON and OFF times are given in GMT to the nearest minute. The ON time is the time the (A or B) HDRSS begins recording experiment measurements; the OFF time is when it stops recording. Usually, the ON and OFF times occur when the satellite is within acquisition range of one of the three STDN stations. The time span between each ON and OFF usually covers part of two DATA ORBITS.

LRIR, THIR, TDRE, SCAM, ESMR, ERB, PMR, TWRL, HIRS

These are the acronyms for each of the experiments on Nimbus 6. (Acronyms longer than four letters have been shortened.) The column beneath each acronym contains a series of "X's" or "blanks." Each "X" in the column indicates that the data for that experiment was processed at GSFC. A "blank" usually indicates that the experiment was turned off for the HDRSS ON-OFF time in that line. A single "blank" in the middle of a series of "X's" frequently means that the experiment was on during that time span but the data has not been processed, or is unavailable for any of several reasons.

DATA ORBIT

A DATA ORBIT begins when the satellite crosses the equator heading in a northbound direction, and ends after the satellite has circled the earth and is about to cross the equator heading in a northbound direction. The DATA ORBIT number increases by one with each successive northbound equator crossing. The ASCENDING NODE and DESCENDING NODE information is referenced to the DATA ORBIT number.

ASCENDING NODE TIME (and) LONG

The ASCENDING NODE is the point in the orbit when the satellite crosses the equator heading in a northbound direction. The TIME of ASCENDING NODE is given in hours (HR), minutes (MN), and seconds (SS) GMT. The longitude (LONG) of ASCENDING NODE is given to the nearest tenth of a degree of east (E) or west (W) longitude. For Nimbus 6, the ascending node crossings always occur during the daytime portion of the orbit at approximately 11:45 a. m. local time.

DESCENDING NODE TIME AND LONG

The DESCENDING NODE is the point within a DATA ORBIT when the satellite crosses the equator heading in a southbound direction. The TIME of DESCENDING NODE is given in hours (HR), minutes (MN), and seconds (SS) GMT. The longitude (LONG) of DESCENDING NODE is given to the nearest degree of east (E) or west (W) longitude. The descending node crossings always occur during the nighttime portion of each orbit at approximately 11:45 p. m. local time.

Table 2-2, together with the World Map (Figure 2-1) and the vellum Subsatellite Tracks Overlay attached to the back of this catalog, can be used to determine approximate geographic coverages and times for experiment data that the user may wish to order. The Overlay contains 14 correctly spaced satellite subpoint tracks, which end at the approximate earth day-to-night transitions. The tracks contain time ticks spaced 5 minutes apart, appropriately annotated at the edge of the overlay and referenced to the equator.

A Subsatellite Tracks Overlay is correctly oriented with the World Map when the ascending or descending node line (equator) on the overlay coincides with the 0-degree latitude line (equator) of the World Map.

Orbital coverage for all orbits on any day is then determined by placing one of the orbit tracks on the overlay at its appropriate ascending node (for daytime data) or descending node (for nighttime data) longitude. (The nodes for each day are listed in Table 2-2.) The orbit track (or tracks) which covers the area of interest is readily apparent.

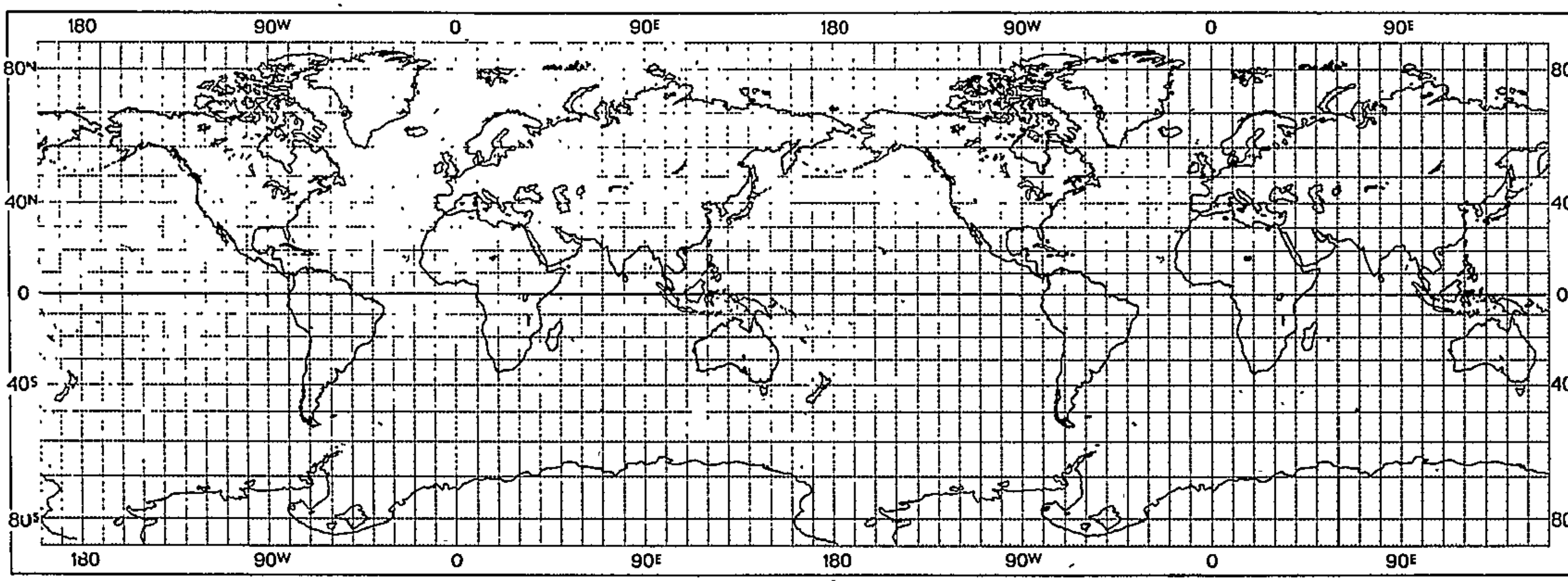


Figure 2-1. World Map

The time (GMT) of satellite passage over an area of interest is calculated by adding or subtracting the minutes from equator crossing (as determined from the overlay) to the appropriate node time (derived from Table 2-2). For daytime orbits, time is added to the ascending node for areas north of the equator, and subtracted from the ascending node for areas south of the equator. For nighttime orbits, time is subtracted from the descending node for areas north of the equator, and added to the descending node for areas south of the equator.

To determine if an experiment was ON during the calculated orbit and time of interest, the user must first "fit" the calculated time into the correct ON-OFF TIME interval of an interrogation orbit listed in Table 2-2. Then the user must check the appropriate experiment column for that line. If an "X" is in the column, the experiment was on and the data has been processed. If the column is "blank", the experiment was off (or the data was not processed) and no data for that orbit is available.

An alternate method of determining geographic coverage and time of data is to use the method described in Section 4. The THIR montages and the vellum Location Guides (attached in the back of this catalog) are used to locate the geographical coverage of each orbit of THIR. The data coverage from other experiments will be within the limits of each THIR swath. The TIME of coverage over a particular area is obtained by using Table 4-1 and adding or subtracting this computed time to the appropriate ascending or descending node time given in Table 2-2.

Each request for data should contain, as a minimum, the name of the experiment for which data is requested, the calendar date of the data, the orbit, the time (GMT) interval of the data needed, and the geographic limits of the area of interest. The procedures described above will provide this information.

The nature and format of the data available from each experiment are explained in detail in the respective sections of The Nimbus 6 User's Guide. The appropriate sources for requesting the various data types are listed in Section 1.7 of the same manua

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TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
14 JULY 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
4260	A	0124	0307				X		X	X	X	X	426	013418	E152.9	022754	W040.5
427R	B	0308	0400	X	X		X		X	X	X	X	427	032139	E126.0	041515	W067.4
428R	A	0405	0549	X	X		X		X	X	X	X	428	050900	E099.2	060236	W094.2
429R	A	0553	0735	X	X		X		X	X	X	X	429	065621	E072.4	074957	W121.0
430A	A	0740	0915	X	X		X		X	X	X	X	430	084342	E045.5	093718	W147.9
431A	A	0919	1101	X	X		X		X	X	X	X	431	103103	E018.7	112439	W174.7
432A	A	1106	1247	X	X		X		X	X	X	X	432	121824	W008.1	131200	E158.5
433A	A	1251	1434	X	X		X		X	X	X	X	433	140545	W035.0	145921	E131.6
434A	A	1438	1618	X	X		X		X	X	X	X	434	155306	W061.8	164642	E104.8
435A	A	1622	1801		X		X	X		X	X	X	435	174027	W088.7	183403	E077.9
436A	A	1805	1946		X		X	X		X	X	X	436	192749	W115.5	202124	E051.1
437A	A	1950	2131		X		X	X		X	X	X	437	211510	W142.4	220845	E024.3
438A	A	2135	2319		X		X	X		X	X	X	438	230231	W169.2	235606	W002.6

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
15 JULY 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
4390	A	0036	0219				X	X		X	X	X	439	004952	E164.0	014327	W029.4
441R	B	0223	0318		X		X	X		X	X	X	440	023713	E137.2	033048	W056.2
441R	A	0318	0501		X		X	X		X	X	X	441	042435	E110.3	051809	W083.1
442R	A	0511	0652		X		X	X		X	X	X	442	061155	E083.5	070531	W109.9
443A	A	0656	0833		X		X	X		X	X	X	443	075916	E056.6	085252	W136.8
444A	A	0838	1018		X		X	X		X	X	X	444	094637	E029.8	104013	W163.6
445A	A	1022	1205		X		X	X		X	X	X	445	113358	E003.0	122734	E169.6
446A	A	1337	1350		X		X	X		X	X	X	446	132119	W023.9	141455	E142.7
447A	A	1354	1533		X		X	X		X	X	X	447	150841	W050.7	160216	E115.9
448A	A	1537	1718		X		X	X		X	X	X	448	165602	W077.6	174937	E089.1
449A	A	1722	1900		X		X	X		X	X	X	449	184323	W104.4	193658	E062.2
450A	A	1903	2048									X	450	203044	W131.2	212419	E035.4
451A	A	2051	2234		X							X	451	221805	W158.1	231140	E008.5

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
16 JULY 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TIDRE	SCAMR	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
452A	A	2237	0023		X							X	452	000526	E175.1	005902	W018.3
4530	B	0023	0114				X	X		X	X	X	453	015247	E148.3	024623	W045.1
4530	A	0122	0321				X	X		X	X	X	454	034008	E121.4	043344	W072.0
454R	B	0328	0419		X		X	X		X	X	X	455	052729	E094.6	062105	W098.8
455R	A	0421	0606		X		X	X		X	X	X	456	071451	E067.7	080826	W125.7
456A	A	0611	0748		X		X	X		X	X	X	457	090212	E040.9	095547	W152.5
457A	A	0752	0933		X		X	X		X	X	X	458	104933	E014.1	114308	W179.3
458A	A	0938	1120		X		X	X		X	X	X	459	123654	W012.7	133029	E153.8
459A	A	1124	1306		X		X	X		X	X	X	460	142415	W039.6	151751	E127.0
460A	A	1310	1452		X		X			X	X	X	461	161136	W066.5	170512	E100.2
461A	A	1457	1636	X	X		X		X	X	X	X	462	175857	W093.3	185233	E073.3
462A	A	1640	1817	X	X		X		X	X	X	X	463	194619	W120.2	203954	E046.5
463A	A	1820	2006	X	X		X		X	X	X	X	464	213340	W147.0	222715	E019.6
465A	A	2010	2159	X	X		X		X	X	X	X	465	232101	W173.8	001436	W007.2

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
17 JULY 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TIDRE	SCAMR	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
4660	B	2339	0041				X		X	X	X	X	466	010822	E159.4	020157	W03409
4660	A	0042	0242									X	467	025543	E132.5	034919	W060.9
468R	B	0243	0331	X	X		X		X	X	X	X	468	044304	E105.7	053640	W087.7
468R	A	0328	0520	X	X							X	469	063029	E078.9	072401	W114.6
469R	A	0527	0706	X	X		X		X	X	X	X	470	081747	E052.1	091122	W141.4
470A	A	0713	0850	X	X		X		X	X	X	X	471	100508	E025.2	105843	W168.2
471A	A	0854	1037	X	X		X		X	X	X	X	472	115229	W001.7	124604	E164.9
472A	A	1040	1222	X	X		X		X	X	X	X	473	133950	W028.5	143326	E138.1
*473A	A	1226	1345	X	X		X		X	X	X	X	474	152712	W055.4	162047	E111.3
474A	A	1412	1552	X	X		X		X	X	X	X	475	171433	W082.2	180808	E084.4
475A	A	1556	1738	X	X		X		X	X	X	X	476	190154	W109.2	195529	E057.6
476A	A	1742	1919	X	X		X		X	X	X	X	477	204915	W135.8	214250	E030.7
477A	A	1923	2109	X								X	478	223636	W162.7	233012	E003.9
478A	A	2113	2256	X	X		X		X	X	X	X					

* LRIR, THIR, AND HIRS OFF AT 1408 GMT

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TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
18 JULY 1975

INT ORBIT AND STDN	HDR S	HDRSS TIME ON HRMN	OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
481R	B	0157	0238	X	X		X		X	X	X	X	479	002358	E170.5	011733	W022.9
481R	A	0239	0437	X	X		X		X	X	X	X	480	021119	E143.6	030454	W049.8
482R	A	0443	0626	X	X		X		X	X	X	X	481	035840	E116.8	045215	W076.6
484A	A	0633	0831	X	X		X		X	X	X	X	482	054601	E090.0	063936	W103.5
485A	B	0851	0954	X	X		X		X	X	X	X	483	073322	E063.1	082658	W130.2
485A	A	0956	1138	X	X							X	484	092044	E036.3	101419	W157.1
486A	A	1142	1323	X	X		X		X	X	X	X	485	110805	E009.4	120140	E176.0
487A	A	1328	1510	X	X		X		X	X	X	X	486	125526	W017.4	134901	E149.2
488A	A	1515	1652		X		X	X		X	X	X	48/	144247	W044.2	153622	E122.4
489A	A	1656	1837		X		X	X		X	X	X	488	163009	W071.1	172344	E095.5
490A	A	1841	2021		X		X	X		X	X	X	489	181730	W097.9	191105	E068.7
491A	A	2025	2209		X		X	X		X	X	X	490	200451	W124.8	205826	E041.8
4930	B	2207	2311				X	X		X	X	X	491	215212	W151.6	224547	E015.0
													492	233934	W178.4	003309	W011.8

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
19 JULY 1975

INT ORBIT AND STDN	HDR S	HDRSS TIME ON HRMN	OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
4930	A	0122	0254				X	X		X	X	X	493	012655	E154.7	022030	W038.7
495R	A	0303	0446		X		X	X		X	X	X	494	031416	E127.9	040751	W065.5
495R	B	0443	0538		X								495	050137	E101.1	055512	W092.4
496R	A	0546	0727		X		X	X		X	X	X	496	064859	E074.2	074234	W119.2
497A	A	0732	0908		X		X	X		X	X	X	497	083620	E047.4	092955	W146.0
498A	A	0912	1054		X		X	X		X	X	X	498	102341	E020.5	111716	W172.9
499A	A	1057	1239		X								499	121102	W006.3	130437	E160.3
500A	A	1242	1425		X								500	135823	W033.2	145159	E133.5
501A	A	1425	1608		X								501	154545	W060.0	163920	E106.6
502A	A	1610	1752		X								502	173306	W086.8	182641	E079.8
503A	A	1755	1940		X								503	192027	W113.7	201402	E052.9
504A	A	1943	2126		X								504	210749	W140.5	220124	E026.1
505A	A	2128	2313		X								505	225510	W167.3	234845	W000.7

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
20 JULY 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
508R	A	0300	0403		X								506	004231	E165.8	013606	W027.6
508R	B	0401	0454		X		X	X		X	X	X	507	022953	E140.0	032328	W054.4
509R	A	0459	0643		X		X	X		X	X	X	508	041714	E112.1	051049	W081.3
510A	A	0647	0824		X		X	X		X	X	X	509	060435	E085.3	065810	W108.1
511A	A	0828	1011		X		X	X		X	X	X	510	075156	E058.5	084531	W134.9
512A	A	1015	1157		X		X	X		X	X	X	511	093918	E031.6	103253	W161.8
513A	A	1201	1344		X		X	X		X	X	X	512	112639	E004.8	122014	E171.4
514A	A	1348	1526		X		X	X		X	X		513	131400	W022.1	140735	E144.6
515A	A	1531	1710		X		X	X		X	X		514	150122	W048.9	155457	E117.7
516A	A	1714	1858		X		X	X		X	X	X	515	164843	W075.7	174218	E090.9
517A	A	1901	2041		X								516	183604	W102.6	192939	E064.0
518A	A	2045	2227		X		X	X		X	X		517	202326	W129.4	211701	E037.2
5190	B	2224	2327				X	X		X	X		518	221047	W156.3	230422	E010.4
													519	235808	E176.9	005143	W016.5

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
21 JULY 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
5200	A	0135	0317				X	X		X	X	X	520	014530	E150.1	023905	W043.3
521R	B	0315	0411		X		X	X		X	X		521	033251	E123.2	042626	W070.2
522R	A	0414	0559		X		X	X		X	X		522	052012	E096.4	061347	W097.0
523A	A	0603	0739		X		X	X		X	X		523	070734	E069.6	080109	W123.8
524A	A	0743	0925		X		X	X		X	X		524	085455	E042.7	094830	W150.7
525A	A	0929	1116		X		X	X		X	X		525	104216	E015.9	113551	W177.5
526A	A	1120	1259		X		X	X		X	X		526	122938	W011.0	132313	E155.7
527A	A	1303	1443		X		X	X		X	X		527	141659	W037.8	151034	E128.8
528A	A	1447	1628	X	X		X		X	X	X		528	160420	W064.6	165755	E102.0
529A	A	1633	1813	X	X		X		X	X	X		529	175142	W091.5	184517	E075.1
530A	A	1817	1957	X	X		X		X	X	X		530	193903	W118.3	203238	E048.3
531A	A	2001	2144	X	X		X		X	X	X		531	212625	W145.2	221959	E021.5
532A	A	2149	2333	X	X		X		X	X	X		532	231546	W172.0	000721	W005.4
5320	B	2330	0029				X		X	X	X						

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TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
22 JULY 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
533O	A	0030	0227				X		X	X	X	X	533	010107	E161.2	015442	W032.2
535R	A	0240	0442	X	X		X		X	X	X	X	534	024829	E134.3	034203	W059.1
536R	A	0522	0702	X	X		X		X	X	X		535	043550	E107.5	052925	W085.9
537A	A	0707	0843	X	X		X		X	X	X		536	062311	E080.7	071646	W112.7
538A	A	0847	1028	X	X		X		X	X	X	X	537	081033	E053.8	090408	W139.6
539A	A	1032	1213	X	X		X		X	X	X	X	538	095754	E027.0	105129	W166.4
540A	A	1217	1401	X	X		X		X	X	X	X	539	114516	E000.1	123850	E166.8
541A	A	1406	1546	X	X		X		X	X	X	X	540	133237	W026.7	142612	E139.9
542A	A	1550	1730	X	X		X		X	X	X	X	541	151958	W053.5	161333	E113.1
543A	A	1734	1911	X	X		X		X	X	X	X	542	170720	W080.4	180054	E086.2
544A	A	1916	2101	X	X		X		X	X	X	X	543	185441	W107.2	194814	E059.4
545A	A	2105	2247	X	X		X		X	X	X	X	544	204203	W134.1	213537	E032.6
													545	222924	W160.9	232258	E005.7

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
23 JULY 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
548R	B	0339	0433	X	X		X		X	X	X	X	546	001645	E172.3	011020	W021.1
549R	A	0434	0618	X	X		X		X	X	X	X	547	020407	E145.4	025741	W048.0
550A	A	0622	0759	X	X		X		X	X	X	X	548	035128	E118.6	044503	W074.8
551A	A	0801	0945	X	X							X	549	053850	E091.8	063224	W101.6
552A	A	0949	1130	X	X		X		X	X	X	X	550	072611	E064.9	081946	W128.5
553A	A	1135	1317	X	X		X		X	X	X	X	551	091332	E038.1	100707	W155.3
554A	A	1321	1501	X	X		X		X	X	X	X	552	110054	E011.2	115429	E177.9
555A	A	1505	1647	X	X		X		X	X	X	X	553	124815	W015.6	134150	E151.0
556A	A	1651	1829	X	X		X		X	X	X	X	554	143537	W042.4	152911	E124.2
557A	A	1833	2017	X	X		X		X	X	X	X	555	162258	W069.3	171633	E097.3
558A	A	2021	2159	X	X		X		X	X	X	X	556	181020	W096.1	190354	E070.5
559O	B	2201	2303				X		X	X	X	X	557	195741	W123.0	205116	E043.7
													558	214503	W149.8	223837	E016.8
													559	233224	W176.6	002559	W010.0

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
24 JULY 1975

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
5590	A	2304	0102				X		X	X	X	X	560	011945	E156.5	021320	W036.9
5600	A	0110	0249				X		X	X	X	X	561	030707	E129.7	040041	W063.7
562R	A	0257	0439	X	X		X		X	X	X	X	562	045428	E102.9	054803	W090.6
562R	B	0438	0530	X	X		X		X	X	X	X	563	064150	E076.0	073524	W117.4
563R	A	0541	0720	X	X		X		X	X	X	X	564	082911	E049.2	092246	W144.2
564A	A	0724	0902	X	X		X		X	X	X	X	565	101633	E022.3	111007	W171.1
565A	A	0906	1047	X	X		X		X	X	X	X	566	120354	W004.5	125729	E162.1
566A	A	1051	1232	X	X		X		X	X	X	X	567	135016	W031.3	144450	E135.3
567A	A	1237	1417	X	X		X		X	X	X	X	568	153837	W058.2	163212	E108.4
568A	A	1422	1602	X	X		X		X	X	X	X	569	172559	W085.3	181933	E081.6
569A	A	1606	1746	X	X		X		X	X	X	X	570	191320	W111.9	200655	E054.7
570A	A	1749	1931	X	X								571	210042	W138.7	215417	E027.9
571A	A	1934	2117	X	X		X		X	X	X	X	572	224803	W165.6	234138	E001.1

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
25 JULY 1975

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
575R	B	0205	0253	X	X		X		X	X	X	X	573	003525	E167.6	012859	W025.8
575R	A	0253	0446	X	X		X		X	X	X	X	574	022246	E140.8	031621	W052.6
576R	A	0457	0634	X	X		X		X	X	X	X	575	041008	E114.0	050342	W079.5
577A	A	0640	0817	X	X		X		X	X	X	X	576	055729	E087.1	065104	W106.3
578A	A	0821	1004	X	X		X		X	X	X	X	577	074451	E060.2	083825	W132.2
579A	A	1008	1149	X	X		X		X	X	X	X	578	093213	E033.4	102547	W160.0
580A	A	1153	1335	X	X		X		X	X	X	X	579	111934	E006.6	121302	E173.2
581A	A	1339	1521	X	X		X		X	X	X	X	580	130655	W020.3	140030	E146.3
582A	A	1525	1707		X		X	X		X	X	X	581	145417	W047.1	154751	E119.5
583A	A	1711	1847		X		X	X		X	X	X	582	164138	W074.0	173513	E092.7
584A	A	1851	2033		X		X	X		X	X	X	583	183000	W100.8	192234	E065.8
585A	A	2037	2220		X		X	X		X	X	X	584	201621	W127.6	210956	E039.0
5860	B	2217	2320				X	X		X	X	X	585	220343	W154.5	225717	E012.1
													586	235104	E178.7	004439	W014.7

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
26 JULY 1975

NT BIT ND TDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
5860	A	2321	0119				X	X		X	X	X	587	013826	E151.9	023200	W041.5
5870	A	0128	0309				X	X		X	X	X	588	032548	E125.0	041922	W068.4
588R	B	0307	0359		X		X	X		X	X	X	589	051309	E098.2	060643	W095.2
589R	A	0409	0554		X		X	X		X	X	X	590	070031	E071.3	075405	W122.1
590A	A	0559	0732		X		X	X		X	X	X	591	084752	E044.5	094127	W148.9
591A	A	0737	0921		X		X	X		X	X	X	592	103514	E017.7	112848	W175.7
592A	A	0925	1107		X		X	X		X	X	X	593	122235	W009.1	131610	E157.4
594A	A	1111	1313		X		X	X		X	X	X	594	140957	W036.0	150331	E130.6
595A	A	1441	1620		X		X	X		X	X	X	595	155716	W062.9	165053	E103.7
596A	A	1624	1806		X		X	X		X	X	X	596	174440	W089.7	183814	E077.2
597A	A	1810	1955		X		X	X		X	X	X	597	193202	W116.5	202536	E050.1
598A	A	1959	2135		X		X	X		X	X	X	598	211923	W143.4	221257	E023.2
599A	A	2139	2325		X		X	X		X	X	X	599	230645	W170.2	000019	W003.6

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
27 JULY 1975

NT BIT ND TDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
5990	B	2323	0026				X	X		X	X	X	600	005406	E163.9	014741	W030.5
6000	A	0027	0222				X	X		X	X	X	601	024128	E136.1	033502	W057.3
602R	A	0232	0413		X		X	X		X	X	X	602	042849	E109.3	052224	W084.2
602R	B	0411	0506		X							X	603	061511	E082.4	070945	W111.0
603R	A	0513	0654		X		X	X		X	X	X	604	080333	E055.6	085707	W137.8
604A	A	0659	0836		X		X	X		X	X	X	605	095054	E028.7	104428	W164.7
605A	A	0840	1022		X		X	X		X	X	X	606	113816	E001.9	123150	E168.5
606A	A	1026	1207		X		X	X		X	X	X	607	132537	W024.9	141912	E141.7
607A	A	1212	1352		X		X	X		X	X	X	608	151259	W051.8	160633	E114.8
608A	A	1356	1537		X		X	X		X	X	X	609	170021	W078.6	175355	E088.0
609A	A	1541	1720		X		X	X		X	X	X	610	184742	W105.5	194116	E061.2
610A	A	1724	1906		X		X	X		X	X	X	611	203504	W132.3	212838	E034.3
611A	A	1910	2053		X		X	X		X	X	X	612	222225	W159.1	231600	E007.5
6130	B	2236	2339				X	X		X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
28 JULY 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	THWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
6130	A	2340	0139									X	613	000947	E174.0	010321	W019.4
6140	A	0146	0327				X	X		X	X	X	614	015709	E147.2	025043	W046.2
615R	B	0325	0422		X		X	X		X	X	X	615	034430	E120.3	043805	W073.1
616R	A	0424	0610		X		X	X		X	X	X	616	053152	E093.5	062526	W099.9
617A	A	0615	0751		X		X	X		X	X	X	617	071914	E066.7	081248	W126.7
618A	A	0755	0939		X		X	X		X	X	X	618	090635	E040.0	100009	W153.6
619A	A	0943	1123		X		X	X		X	X	X	619	105357	E013.0	114731	E179.6
620A	A	1127	1310		X		X	X		X	X	X	620	124118	W013.8	133453	E153.7
621A	A	1314	1456		X		X	X	X	X	X	X	621	142840	W040.7	152214	E125.9
622A	A	1500	1637	X	X		X		X	X	X	X	622	161602	W067.5	170936	E099.1
623A	A	1642	1822	X	X		X		X	X	X	X	623	180323	W094.4	185658	E072.2
624A	A	1826	2007	X	X		X		X	X	X	X	624	195045	W121.2	204419	E045.4
625A	A	2012	2155	X	X		X		X	X	X	X	625	213807	W148.1	223141	E018.6
6260	A	2159	2342				X		X	X	X	X	626	232528	W174.9	001903	W008.3

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
29 JULY 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	THWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
6260	B	2341	0044				X		X	X	X	X	627	011250	E158.3	020624	W035.1
6270	A	0045	0238				X		X	X	X	X	628	030012	E131.4	035346	W062.0
629R	A	0249	0431	X	X		X		X	X	X	X	629	044733	E104.6	054107	W088.8
629R	B	0430	0523	X	X		X		X	X	X	X	630	063455	E077.8	072829	W115.6
630R	A	0530	0712	X	X		X		X	X	X	X	631	082217	E051.0	091551	W142.5
631A	A	0717	0853	X	X		X		X	X	X	X	632	100938	E024.1	110312	W169.3
632A	A	0857	1039	X	X		X		X	X	X	X	633	115700	W002.8	125034	E163.8
633A	A	1043	1226	X	X		X		X	X	X	X	634	134422	W029.6	143756	E137.0
634A	A	1230	1411	X	X		X		X	X	X	X	635	153143	W056.5	162518	E110.2
635A	A	1415	1555	X	X		X		X	X	X	X	636	171905	W083.3	181240	E083.3
636A	A	1559	1740	X	X		X		X	X	X	X	637	190627	W110.2	200001	E056.5
637A	A	1744	1926	X	X		X		X	X	X	X	638	205348	W137.0	214723	E029.6
638A	A	1930	2111	X	X		X		X	X	X	X	639	224110	W163.8	233444	E002.8
639A	A	2116	2256	X	X		X		X	X	X	X					
6400	B	2251	2354				X		X	X	X	X					

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
30 JULY 1975

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
6400	A	2355	0153				X		X	X	X	X	640	002832	E169.3	012206	W024.1
6410	A	0205	0341				X		X	X	X	X	641	021554	E142.5	030928	W050.9
642R	B	0343	0441	X	X		X		X	X	X	X	642	040315	E115.6	045649	W077.7
643R	A	0445	0633	X	X		X		X	X	X	X	643	055037	E088.8	064411	W104.6
644A	A	0637	0809	X	X		X		X	X	X	X	644	073759	E062.0	083133	W131.4
645A	A	0813	0957	X	X		X		X	X	X	X	645	092520	E035.1	101854	W158.3
646A	A	0958	1143	X	X							X	646	111242	E008.3	120616	E174.9
647A	A	1147	1327	X	X		X		X	X	X	X	647	130004	W018.6	135338	E148.1
648A	A	1331	1515	X	X		X		X	X	X	X	648	144726	W045.4	154100	E121.2
649A	A	1519	1656		X		X	X		X	X	X	649	162344	W072.2	172821	E094.4
650A	A	1700	1840		X		X	X		X	X	X	650	182209	W099.1	191543	E067.6
651A	A	1844	2024		X		X	X		X	X	X	651	200931	W125.9	210305	E040.7
652A	A	2028	2211		X		X	X		X	X	X	652	215653	W152.7	225027	E013.9
6540	B	2210	2311				X	X		X	X	X	653	234414	W179.6	003748	W013.0

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
31 JULY 1975

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
6530	A	2314	0110				X	X		X	X	X	654	013136	E153.6	022600	W039.8
6540	A	0125	0258				X	X		X	X	X	655	031858	E126.7	041232	W066.7
656R	A	0347	0543		X		X	X		X	X	X	656	050619	E099.9	055954	W093.5
657R	A	0549	0732		X		X	X		X	X	X	657	065341	E073.1	074715	W120.4
658A	A	0737	0913		X		X	X		X	X	X	658	084103	E046.2	093437	W147.2
659A	A	0917	1058		X		X	X		X	X	X	659	102823	E019.4	112159	W174.0
660A	A	1103	1243		X		X	X		X	X	X	660	121547	W007.5	130921	E159.2
661A	A	1247	1428		X		X	X		X	X	X	661	140308	W034.3	145642	E132.3
662A	A	1432	1615		X		X	X		X	X	X	662	155030	W061.2	164404	E105.5
663A	A	1619	1758		X		X	X		X	X	X	663	173752	W088.0	183126	E078.6
664A	A	1802	1943		X		X	X		X	X	X	664	192514	W114.8	201848	E051.8
665A	A	2019	2128		X		X	X		X	X	X	665	211235	W141.7	220609	E024.9
666A	A	2132	2317		X		X	X		X	X	X	666	225957	W168.5	235331	W002.0

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
01 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
669R	B	0154	0258		X		X	X		X	X	X	667	004204	E165.9	013537	W027.5
669R	A	0259	0457		X		X	X		X	X	X	668	022924	E139.1	032258	W054.3
670R	A	0506	0647		X		X	X		X	X	X	669	041645	E112.3	051018	W081.1
671A	A	0652	0830		X		X	X		X	X	X	670	060405	E085.4	065739	W108.0
672A	A	0834	1015		X							X	671	075125	E058.6	084459	W134.8
673A	A	1018	1202		X							X	672	093846	E031.8	103219	W161.6
674A	A	1205	1345		X							X	673	112606	E004.9	121940	E171.5
675A	A	1349	1531		X		X	X		X	X	X	674	131327	W021.9	140700	E144.7
676A	A	1535	1714		X							X	675	150047	W048.7	155420	E117.9
677A	A	1718	1859		X		X	X		X	X	X	676	164807	W075.6	1/4141	E091.0
678A	A	1904	2046		X		X	X		X	X	X	677	183528	W102.4	192901	E064.2
6791	A	2050	2232		X		X	X		X	X	X	678	202248	W129.2	211621	2037.4
6800	B	2317	2330				X	X		X		X	679	221009	W156.1	230342	E010.5
													680	235729	E177.1	005102	W016.3

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
02 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
6800	A	2331	0129				X	X		X	X	X	681	014449	E150.3	023823	W043.1
6810	A	0141	0317				X	X		X	X	X	682	033210	E123.4	042543	W070.0
682R	B	0317	0415		X		X	X		X	X	X	683	051930	E096.6	061304	W096.8
683R	A	0419	0603		X		X	X		X	X	X	684	070650	E069.8	080024	W123.6
684A	A	0607	0745		X		X	X		X	X	X	685	085411	E042.9	094744	W150.5
685A	A	0749	0931		X		X	X		X	X	X	686	104131	E016.1	113505	W177.3
686A	A	0935	1118		X		X	X		X	X	X	687	122852	W010.8	132225	E155.9
687A	A	1122	1301		X		X	X		X	X	X	688	141612	W037.6	150945	E129.0
688A	A	1305	1446		X		X	X		X	X	X	689	160332	W064.4	165706	E102.2
689A	A	1451	1634	X	X		X		X	X	X	X	690	175053	W091.3	184426	E075.4
690A	A	1639	1816	X	X		X		X	X	X	X	691	193813	W118.1	203147	E048.5
691A	A	1820	2001	X	X		X		X	X	X	X	692	212534	W144.9	221907	E021.7
692A	A	2005	2148	X	X		X		X	X	X	X	693	231254	W171.8	000627	W005.2
693A	A	2152	2334	X	X		X		X	X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
03 AUGUST 1975

NT BIT ND TDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
6930	B	2332	0035									X	694	010014	E161.4	015348	W032.0
6940	A	0035	0238									X	695	024735	E134.6	034108	W058.8
696R	A	0245	0424	X	X		X		X	X	X	X	696	043455	E107.7	052828	W085.7
696R	B	0423	0515	X	X		X		X	X	X	X	697	062215	E080.9	071549	W112.5
697R	A	0523	0706	X	X		X		X	X	X	X	698	080936	E054.1	090309	W139.3
698A	A	0711	0847	X	X		X		X	X	X	X	699	095656	E027.2	105030	W166.2
699A	A	0851	1033	X	X		X		X	X	X	X	700	114417	E000.4	123750	E167.0
700A	A	1038	1218	X	X		X		X	X	X	X	701	133137	W026.4	142510	E140.2
701A	A	1222	1405	X	X		X		X	X	X	X	702	151857	W053.3	161231	E113.3
702A	A	1410	1549	X	X		X		X	X	X	X	703	170618	W080.1	175951	E086.5
703A	A	1554	1735	X	X		X		X	X	X	X	704	185338	W107.0	194712	E059.7
704A	A	1739	1917	X	X		X		X	X	X	X	705	204059	W133.8	213432	E032.8
705A	A	1921	2105	X	X		X		X	X	X	X	706	222819	W160.6	232152	E006.0
706A	A	2110	2250	X	X		X		X	X	X	X					
7070	B	2246	2349				X		X	X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
04 AUGUST 1975

NT BIT ND TDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7070	A	2350	0148				X		X	X	X	X	707	001539	E172.6	010913	W020.9
7080	A	0204	0337				X		X	X	X	X	708	020300	E145.7	025633	W047.7
709R	B	0337	0432	X	X		X		X	X	X	X	709	035020	E118.9	044353	W074.5
710R	A	0435	0623	X	X		X		X	X	X	X	710	053741	E092.0	063114	W101.4
711A	A	0627	0803	X	X		X		X	X	X	X	711	072501	E065.2	081834	W128.2
712A	A	0807	0950	X	X		X		X	X	X	X	712	091221	E038.4	100555	W155.0
713A	A	0954	1135	X	X		X		X	X	X	X	713	105942	E011.5	115315	E178.1
714A	A	1139	1321	X	X		X		X	X	X	X	714	124702	W015.0	134035	E151.3
715A	A	1325	1507	X	X		X		X	X	X	X	715	143422	W042.1	152756	E124.5
716A	A	1511	1649		X		X	X		X	X	X	716	162143	W069.0	171516	E097.6
717A	A	1653	1833		X		X	X		X	X	X	717	180903	W095.8	190237	E070.8
718A	A	1837	2021		X		X	X		X	X	X	718	195624	W122.6	204957	E044.0
719A	A	2026	2206		X		X	X		X	X	X	719	214344	W149.5	223717	E017.1
7210	B	2203	2302				X	X		X	X	X	720	233104	W176.3	002438	W009.7

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TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
05 AUGUST 1975

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7200	A	2307	0105				X	X		X	X	X	721	012459	E155.2	021833	W038.2
7210	A	0116	0250				X	X		X	X	X	722	031221	E128.4	040555	W065.0
723R	A	0300	0442		X		X	X		X	X	X	723	045943	E101.5	055317	W091.9
723R	B	0441	0533		X		X	X		X	X	X	724	064705	E074.7	074039	W118.7
724R	A	0542	0725		X		X	X		X	X	X	725	083427	E047.8	092801	W145.6
725A	A	0729	0906		X		X	X		X	X	X	726	102149	E021.0	111523	W172.4
726A	A	0935	1052		X		X	X		X	X	X	727	120911	W005.9	130245	E160.8
727A	A	1056	1239		X		X	X		X	X	X	728	135633	W032.7	145007	E134.0
728A	A	1243	1426		X		X	X		X	X	X	729	154355	W059.5	163729	E107.1
729A	A	1430	1610		X		X	X		X	X	X	730	173117	W086.4	182450	E080.3
730A	A	1613	1751		X		X	X		X	X	X	731	191839	W113.2	201212	E053.4
731A	A	1755	1935		X		X	X		X	X	X	732	210601	W140.1	215934	E026.6
732A	A	1939	2123		X		X	X		X	X	X	733	225323	W166.9	234656	W000.3
733A	A	2127	2309		X		X	X		X	X	X					
7340	B	2305	0008				X	X		X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
06 AUGUST 1975

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7340	A	0009	0206				X	X		X	X	X	734	004045	E166.3	013418	W027.1
736R	A	0215	0358		X		X	X		X	X	X	735	022807	E139.5	032140	W053.9
736R	B	0358	0450		X		X	X		X	X	X	736	041529	E112.6	050902	W080.8
737R	A	0458	0642		X		X	X		X	X	X	737	060251	E085.8	065624	W107.6
738A	A	0646	0822		X		X	X		X	X	X	738	075013	E058.9	084346	W134.5
739A	A	0826	1008		X		X	X		X	X	X	739	093735	E032.1	103108	W161.3
740A	A	1012	1155		X		X	X		X	X	X	740	112457	E005.2	121830	E171.8
741A	A	1200	1340		X		X	X		X	X	X	741	131219	W021.6	140552	E145.0
742A	A	1344	1527	X	X		X	X	X	X	X	X	742	145941	W048.4	155314	E118.2
743A	A	1531	1707	X	X		X		X	X	X	X	743	164703	W075.3	174036	E091.3
744A	A	1711	1855	X	X		X		X	X	X	X	744	183425	W102.1	192758	E064.5
745A	A	1859	2040	X	X		X		X	X	X	X	745	202147	W129.0	211520	E037.6
746A	A	2044	2225	X	X		X		X	X	X	X	746	220909	W155.8	230242	E010.8
7470	B	2221	2324				X		X	X	X	X	747	235631	E177.3	005004	W016.1

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
07 AUGUST 1975

NT BIT ND TDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7470	A	2325	0122				X		X	X	X	X	748	014353	E150.5	023726	W042.9
7480	A	0133	0310									X	749	033115	E123.7	042448	W069.7
749R	B	0310	0409	X	X		X		X	X	X	X	750	051837	E096.8	061210	W096.6
750R	A	0412	0602	X	X		X		X	X	X	X	751	070559	E070.0	075932	W123.4
751A	A	0607	0738	X	X		X		X	X	X	X	752	085321	E043.1	094654	W150.3
752A	A	0742	0924	X	X		X		X	X	X	X	753	104043	E016.3	113417	W177.1
753A	A	0929	1113	X	X		X		X	X	X	X	754	122805	W010.6	132139	E156.0
754A	A	1117	1257	X	X		X		X	X	X	X	755	141527	W037.4	150901	E129.2
755A	A	1301	1444	X	X		X		X	X	X	X	756	160249	W064.3	165623	E102.4
756A	A	1448	1624	X	X	X	X			X	X	X	757	175011	W091.1	184345	E075.5
757A	A	1628	1812	X	X	X	X			X	X	X	758	193733	W117.9	203107	E048.7
758A	A	1815	1955	X	X							X	759	212455	W144.8	221829	E021.9
759A	A	1958	2142	X	X	X	X			X	X	X	760	231217	W171.6	000551	W005.0
760A	A	2146	2330	X	X		X		X	X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
08 AUGUST 1975

NT BIT ND TDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
763R	A	0211	0410	X	X		X		X	X	X	X	761	005939	E161.6	015313	W031.8
764R	B	0410	0514	X	X		X		X	X	X	X	762	024701	E134.7	034035	W058.7
764R	A	0520	0659	X	X		X		X	X	X	X	763	043423	E107.9	052757	W085.5
765A	A	0703	0841	X	X		X		X	X	X	X	764	062145	E081.0	071519	W112.3
766A	A	0845	1028	X	X		X		X	X	X	X	765	080907	E054.2	090241	W139.2
767A	A	1032	1214	X	X		X		X	X	X	X	766	095630	E027.4	105003	W166.0
768A	A	1219	1359	X	X		X		X	X	X	X	767	114352	E000.5	123725	E167.1
769A	A	1403	1541	X	X		X		X	X	X	X	768	133114	W026.3	142447	E140.3
770A	A	1547	1729		X	X	X	X		X	X	X	769	151836	W053.2	161209	E113.4
771A	A	1733	1914		X	X	X			X	X	X	770	170558	W080.0	175931	E086.6
772A	A	1918	2058		X	X	X			X	X	X	771	185320	W106.9	194654	E059.7
773A	A	2102	2244		X	X	X			X	X	X	772	204042	W133.7	213416	E032.9
7740	B	2238	2342			X	X			X	X	X	773	222804	W160.6	232138	E006.0

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
09 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7740	A	2347	0137			X	X	X		X	X	X	774	001526	E172.6	010900	W020.8
7750	A	0152	0334				X	X		X	X	X	775	020248	E145.8	025622	W047.6
776R	B	0333	0426		X		X	X		X	X	X	776	035010	E118.9	044344	W074.5
777R	A	0430	0614		X		X	X		X	X	X	777	053733	E092.1	063106	W101.3
778A	A	0620	0756		X		X	X		X	X	X	778	072455	E065.2	081828	W128.2
779A	A	0800	0942		X		X	X		X	X	X	779	091217	E038.4	100550	W155.0
780A	A	0946	1130		X		X	X		X	X	X	780	105939	E011.6	115313	E178.2
781A	A	1134	1315		X		X	X		X	X	X	781	124701	W015.3	134035	E151.3
782A	A	1319	1501		X		X	X		X	X	X	782	143423	W042.2	152757	E124.5
783A	A	1505	1645		X		X	X		X	X	X	783	162145	W069.0	171519	E097.2
784A	A	1650	1829		X		X	X		X	X	X	784	180907	W095.8	190241	E070.8
785A	A	1833	2014		X		X	X		X	X	X	785	195630	W122.7	205003	E044.0
786A	A	2018	2200		X		X	X		X	X	X	786	214352	W149.5	223725	E017.1
7880	B	2156	2300				X	X		X	X	X	787	233114	W176.3	002447	W009.7
7870	A	2301	0059				X	X		X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
10 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7880	A	0111	0246				X	X		X	X	X	788	011836	E156.8	021210	W036.6
790R	B	0255	0436		X		X	X		X	X	X	789	030558	E130.0	035932	W063.4
790R	B	0436	0527		X		X	X		X	X	X	790	045320	E103.1	054654	W090.3
791R	A	0537	0718		X		X	X		X	X	X	791	064042	E076.3	073416	W117.1
792A	A	072[illegible]	0859		X		X	X		X	X	X	792	082805	E049.4	092138	W144.0
793A	A	090[illegible]	1045		X		X	X		X	X	X	793	101527	E022.6	110900	W170.8
794A	A	1050	1233		X		X	X		X	X	X	794	120249	W004.3	125622	E162.4
795A	A	1237	1417		X		X	X		X	X	X	795	135011	W031.1	144345	E135.5
796A	A	1421	1603	X	X		X		X	X	X	X	796	153733	W057.9	163107	E108.7
797A	A	1608	1747	X	X		X		X	X	X	X	797	172455	W084.8	181829	E081.8
798A	A	1751	1930	X	X		X		X	X	X	X	798	191217	W111.6	200551	E055.0
799A	A	1934	2117	X	X		X		X	X	X	X	799	205940	W138.5	215313	E028.2
800A	A	2121	2304	X	X		X		X	X	X	X	800	224702	W165.3	234035	E001.3

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TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
11 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
8010	A	0002	0157				X		X	X	X	X	801	003424	E167.9	012758	W025.5
8020	A	0209	0353				X		X	X	X	X	802	022146	E141.0	031520	W052.4
803R	B	0347	0443	X	X		X		X	X	X	X	803	040908	E114.2	050242	W079.2
805A	A	0642	0818	X	X		X		X	X	X	X	804	055631	E087.3	065004	W106.1
806A	A	0822	1003	X	X		X		X	X	X	X	805	074353	E060.5	083726	W132.9
807A	A	1007	1148	X	X		X		X	X	X	X	806	093115	E033.7	102449	W159.7
808A	A	1152	1334	X	X		X		X	X	X	X	807	111837	E006.8	121211	E173.4
809A	A	1338	1519	X	X		X		X	X	X	X	808	130559	W020.0	135933	E146.6
810A	A	1523	1702	X	X		X		X	X	X	X	809	145322	W046.9	154655	E119.7
811A	A	1706	1848	X	X		X		X	X	X	X	810	164044	W073.7	173417	E092.9
812A	A	1852	2035	X	X		X		X	X	X	X	811	182806	W100.6	192140	E066.1
813A	A	2040	2219	X	X		X		X	X	X	X	812	201528	W127.4	210902	E039.2
8140	B	2213	2316				X		X	X	X	X	813	220250	W154.3	225624	E012.4
													814	235013	E178.9	004346	W014.5

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
12 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
8140	A	2317	0115				X		X	X	X	X	815	013735	E152.1	023108	W041.3
8150	A	0127	0312				X		X	X	X	X	816	032457	E125.2	041831	W068.2
816R	B	0307	0405	X	X		X		X	X	X	X	817	051219	E098.4	060553	W095.0
817R	A	0406	0549	X	X		X		X	X	X	X	818	065942	E071.5	075315	W121.9
818A	A	0554	0733	X	X		X		X	X	X	X	819	084704	E044.7	094037	W148.7
819A	A	0737	0918	X	X		X		X	X	X	X	820	103426	E017.9	112800	W175.5
820A	A	0924	1103	X	X		X		X	X	X	X	821	122148	W009.0	131522	E157.6
821A	A	1107	1251	X	X		X		X	X	X	X	822	140910	W035.8	150244	E130.8
822A	A	1255	1437	X	X		X		X	X	X	X	823	155633	W062.7	165006	E103.9
823A	A	1441	1621		X		X	X		X	X	X	824	174355	W089.5	183729	E077.1
824A	A	1626	1804		X		X	X		X	X	X	825	193117	W116.4	202451	E050.3
825A	A	1808	1948		X		X	X		X	X	X	826	211840	W143.2	221213	E023.4
826A	A	1952	2137		X		X	X		X	X	X	827	230602	W170.0	235935	W003.4
827A	A	2157	2322		X		X	X		X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
13 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
8280	B	2321	0024				X	X		X	X	X	828	005324	E163.1	014658	W030.3
8280	A	0024	0222				X	X		X	X	X	829	024046	E136.3	033420	W057.1
830R	A	0229	0414		X		X	X		X	X	X	830	042809	E109.4	052142	W084.0
830R	B	0413	0505		X		X	X		X	X	X	831	061531	E082.6	070904	W110.8
831R	A	0511	0654		X		X	X		X	X	X	832	080253	E055.7	085627	W137.7
832A	A	0658	0835		X		X	X		X	X	X	833	095015	E028.9	104349	W164.5
833A	A	0840	1023		X		X	X		X	X	X	834	113738	E002.0	123111	E168.7
834A	A	1028	1210		X		X	X		X	X	X	835	132500	W024.8	141833	E141.8
835A	A	1214	1352		X		X	X		X	X	X	836	151222	W051.6	160556	E115.0
836A	A	1356	1537		X		X	X		X	X	X	837	165944	W078.5	175318	E088.1
837A	A	1541	1722		X		X	X		X	X	X	838	184707	W105.3	194040	E061.3
838A	A	1725	1906		X							X	839	203429	W132.2	212803	E034.5
839A	A	1910	2055		X		X	X		X	X	X	840	222151	W159.0	231525	E007.6
840A	A	2059	2240		X		X	X		X	X	X					
8410	B	2236	2339				X	X		X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
14 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
8410	A	2339	0134				X	X		X	X	X	841	000914	E174.2	010247	W019.2
8420	A	0146	0326				X	X		X	X	X	842	015636	E147.3	025010	W046.1
843R	B	0326	0423		X		X	X		X	X	X	843	034358	E120.5	043732	W072.9
844R	A	0425	0609		X		X	X		X	X	X	844	053121	E093.6	062454	W099.8
845A	A	0614	0754		X		X	X		X	X	X	845	071843	E066.8	081216	W126.6
846A	A	0758	0939		X		X	X		X	X	X	846	090605	E039.9	095939	W153.5
847A	A	0943	1126		X		X	X		X	X	X	847	105327	E013.1	114701	E179.7
848A	A	1130	1309		X		X	X		X	X	X	848	124050	W013.8	133424	E152.9
849A	A	1313	1454		X		X	X		X	X	X	849	142812	W040.6	152146	E126.0
850A	A	1458	1639	X	X		X		X	X	X	X	850	161534	W067.4	170908	E099.2
851A	A	1643	1824	X	X		X		X	X	X	X	851	180257	W094.3	180631	E072.3
852A	A	1828	2009	X	X		X		X	X	X	X	852	195019	W121.1	204353	E045.5
853A	A	2013	2155	X	X		X		X	X	X	X	853	213741	W148.0	223115	E018.6
854A	A	2159	2342	X	X		X		X	X	X	X	854	232504	W174.8	001837	W008.2

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
15 AUGUST 1975

INT RBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
857R	B	0221	0324	X	X		X		X	X	X	X	855	011226	E158.4	020600	W035.0
857R	A	0324	0521	X	X		X		X	X	X	X	856	025948	E131.5	035322	W061.9
858R	A	0530	0713	X	X		X		X	X	X	X	857	044711	E104.7	054044	W088.7
859A	A	0717	0855	X	X		X		X	X	X	X	858	063433	E077.8	072807	W115.6
860A	A	0859	1042	X	X		X		X	X	X	X	859	082155	E051.0	091529	W142.4
861A	A	1046	1228	X	X		X		X	X	X	X	860	100918	E024.1	110251	W169.3
862A	A	1233	1413	X	X		X		X	X	X	X	861	115640	W002.7	125014	E163.9
863A	A	1417	1555	X	X		X		X	X	X	X	862	134403	W029.5	143736	E137.1
864A	A	1559	1740	X	X		X		X	X	X	X	863	153125	W056.4	162459	E110.2
865A	A	1744	1923	X	X		X		X	X	X	X	864	171847	W083.2	181221	E083.4
866A	A	1927	2111	X	X		X		X	X	X	X	865	190610	W110.1	195943	E056.5
867A	A	2257	2258										866	205332	W136.9	214706	E029.7
8680	B	2255	2358				X		X	X	X	X	867	224054	W163.8	233428	E002.8

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
16 AUGUST 1975

INT RBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
8680	A	2359	0157				X		X	X	X	X	868	002817	E169.4	012150	W024.0
8690	A	0205	0347				X		X	X	X	X	869	021539	E142.5	030913	W050.9
870R	B	0345	0439	X	X		X		X	X	X	X	870	040302	E115.7	045635	W077.7
871R	A	0443	0628	X	X		X		X	X	X	X	871	055024	E088.9	064358	W104.5
872A	A	0632	0811	X	X		X		X	X	X	X	872	073746	E062.0	083120	W131.4
873A	A	0815	0955	X	X		X		X	X	X	X	873	092509	E035.2	101842	W158.2
874A	A	0959	1146	X	X		X		X	X	X	X	874	111231	E008.3	120605	E174.9
875A	A	1151	1325	X	X		X		X	X	X	X	875	125954	W018.5	135327	E148.1
876A	A	1334	1511	X	X		X		X	X	X	X	876	144716	W045.4	154050	E121.2
877A	A	1515	1657		X		X	X	X	X	X	X	877	163438	W072.2	172812	E094.4
878A	A	1701	1841		X		X	X		X	X	X	878	182201	W099.1	191534	E067.6
879A	A	1845	1958		X		X	X		X	X	X	879	200923	W125.9	210257	E040.7
880A	A	2030	2215		X		X	X		X	X	X	880	215646	W152.7	225019	E013.9
881A	A	2219	0001		X		X	X		X	X	X	881	234408	W179.6	003742	E013.0

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
17 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
8820	B	2400	0103				X	X		X	X	X	882	013131	E153.6	022504	W039.8
8820	A	0103	0301				X	X		X	X	X	883	031853	E126.7	041227	W066.7
883R	B	0307	0400		X		X	X		X	X	X	884	050615	E099.9	055949	W093.5
884R	A	0401	0546		X		X	X		X	X	X	885	065338	E073.0	074711	W120.4
885A	A	0550	0726		X		X	X		X	X	X	886	084100	E046.2	093434	W147.2
886A	A	0730	0913		X		X	X		X	X	X	887	102823	E019.4	112156	W174.0
887A	A	0918	1100		X		X	X		X	X	X	888	121545	W007.5	130919	E159.2
888A	A	1103	1247										889	140307	W034.3	145641	E132.3
889A	A	1251	1430		X		X	X		X	X	X	890	155030	W061.2	164404	E105.5
890A	A	1434	1614		X		X	X		X	X	X	891	173752	W088.0	183126	E078.6
891A	A	1618	1757		X		X	X		X	X	X	892	192515	W114.8	201848	E051.8
892A	A	1801	1942		X		X	X		X	X	X	893	211237	W141.7	220611	E024.9
893A	A	1946	2130		X		X	X		X	X	X	894	230000	W168.5	235333	W001.9
894A	A	2134	2317		X		X	X		X	X	X					
8940	B	2315	0018				X	X		X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
18 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
8950	A	0115	0134										895	004722	E164.6	014056	W028.8
897R	A	0225	0411		X		X	X		X	X	X	896	023445	E137.8	032818	W055.6
897R	B	0411	0500		X		X	X		X	X	X	897	042207	E111.0	051541	W082.5
898R	A	0504	0648		X		X	X		X	X	X	898	060930	E084.1	070303	W109.3
899A	A	0652	0829		X		X	X		X	X	X	899	075652	E057.3	085026	W136.1
900A	A	0834	1015		X		X	X		X	X	X	900	094415	E030.4	103748	W163.0
901A	A	1018	1201		X		X	X		X	X	X	901	113137	E003.6	122511	E170.2
902A	A	1205	1348		X		X	X		X	X	X	902	131900	W023.3	141233	E143.3
903A	A	1353	1530		X		X	X		X	X	X	903	150622	W050.1	155956	E116.5
904A	A	1534	1716	X	X	X	X			X	X	X	904	165344	W076.0	174718	E089.6
905A	A	1721	1900	X	X	X	X			X	X	X	905	184107	W103.8	193441	E062.8
906A	A	1904	2045	X	X	X	X			X	X	X	906	202829	W130.7	212203	E036.0
907A	A	2049	2235	X	X	X	X			X	X	X	907	221552	W157.5	230926	E009.1
9080	B	2231	2334			X	X			X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
19 AUGUST 1975

INT RBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
9080	A	2334	0040				X		X	X	X	X	908	000313	E175.7	005647	W017.7
9090	A	0143	0320				X		X	X	X	X	909	015036	E148.8	024410	W044.6
910R	B	0321	0418	X	X		X		X	X	X	X	910	033758	E122.0	043132	W071.4
911R	A	0419	0603	X	X		X		X	X	X	X	911	052521	E095.1	061855	W098.3
912A	A	0608	0745	X	X		X		X	X	X	X	912	071243	E068.3	080617	W125.1
913A	A	0749	0933	X	X		X		X	X	X	X	913	090006	E041.4	095340	W152.0
914A	A	0937	1117	X	X		X		X	X	X	X	914	104728	E014.6	114102	W178.8
915A	A	1121	1304	X	X		X		X	X	X	X	915	123451	W012.3	132825	E154.4
916A	A	1309	1448	X	X		X		X	X	X	X	916	142214	W039.1	151547	E127.5
917A	A	1452	1632	X	X		X		X	X	X	X	917	160936	W065.9	170310	E100.7
918A	A	1636	1817	X	X		X		X	X	X	X	918	175659	W092.8	185032	E073.8
919A	A	1821	2002	X	X		X		X	X	X	X	919	194421	W119.6	203755	E047.0
920A	A	2006	2147	X	X		X		X	X	X	X	920	213144	W146.5	222517	E020.1
921A	A	2152	2335	X	X		X		X	X	X	X	921	231906	W173.3	001240	W006.7

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
20 AUGUST 1975

NT BIT ND TDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
9210	B	2338	0040				X		X	X	X	X	922	010629	E159.8	020003	W033.5
9220	A	0040	0236				X		X	X	X	X	923	025351	E133.0	034725	W060.4
924R	A	0244	0427	X	X		X		X	X	X	X	924	044114	E106.2	053448	W087.2
924R	B	0426	0518	X	X		X		X	X	X	X	925	062836	E079.3	072210	W114.1
925R	A	0525	0707	X	X		X		X	X	X	X	926	081559	E052.5	090933	W140.9
926A	A	0711	0851	X	X		X		X	X	X	X	927	100321	E025.6	105655	W167.8
927A	A	0855	1034	X	X		X		X	X	X	X	928	115044	W001.2	124418	E165.4
928A	A	1038	1222	X	X		X		X	X	X	X	929	133807	W028.1	143140	E138.5
929A	A	1226	1406	X	X		X		X	X	X	X	930	152529	W054.9	161903	E111.7
930A	A	1411	1551	X	X		X		X	X	X	X	931	171252	W081.8	180626	E084.9
931A	A	1555	1734		X		X	X		X	X	X	932	190014	W108.6	195348	E058.0
932A	A	1738	1919		X		X	X		X	X	X	933	204737	W135.4	214111	E031.2
933A	A	1923	2106		X		X	X		X	X	X	934	223459	W162.3	232833	E004.3
934A	A	2110	2251		X		X	X		X	X	X					
9350	B	2251	2354				X	X		X	X	X					

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TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
21 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
9350	A	2354	0151				X	X		X	X	X	935	002222	E170.9	011556	W022.5
9360	A	0201	0339				X	X		X	X	X	936	020945	E144.0	030318	W049.4
937R	B	0341	0435		X		X	X		X	X	X	937	035707	E117.2	045041	W076.2
938R	A	0437	0623		X		X	X		X	X	X	938	054430	E090.4	063804	W103.0
939A	A	0627	0805		X		X	X		X	X	X	939	073152	E063.5	082526	W129.9
940A	A	0809	0951		X		X	X		X	X	X	940	091915	E036.7	101249	W156.8
941A	A	0955	1137		X		X	X		X	X	X	941	110638	E009.8	120011	E176.4
942A	A	1141	1323		X		X	X		X	X	X	942	125400	W017.1	134734	E149.5
943A	A	1327	1507		X		X	X		X	X	X	943	144123	W043.9	153457	E122.7
944A	A	1511	1652		X		X	X		X	X	X	944	162845	W070.8	172219	E095.9
945A	A	1656	1834		X		X	X		X	X	X	945	181608	W097.6	190942	E069.0
946A	A	1838	2021		X		X	X		X	X	X	946	200331	W124.4	205704	E042.2
947A	A	2025	2207		X		X	X		X	X	X	947	215053	W151.3	224427	E015.3
9480	B	2205	2309				X	X		X	X	X	948	233816	W178.1	003150	W011.5

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
22 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
9480	A	2309	0107				X	X		X	X	X	949	012538	E155.0	021912	W038.4
9490	A	0116	0256				X	X		X	X	X	950	031301	E128.2	040635	W065.2
951R	A	0303	0445		X		X	X		X	X	X	951	050024	E101.3	055358	W092.0
951R	B	0446	0538		X		X	X		X	X	X	952	064746	E074.5	074120	W118.9
952R	A	0543	0709		X		X	X		X	X	X	953	083509	E047.7	092843	W145.7
953A	A	0730	0907		X		X	X		X	X	X	954	102232	E020.8	111606	W172.6
954A	A	0911	1053		X		X	X		X	X	X	955	120954	W006.0	130328	E160.6
955A	A	1057	1241		X		X	X		X	X	X	956	135717	W032.7	145051	E133.8
956A	A	1246	1424		X		X	X		X	X	X	957	154440	W059.7	163813	E106.9
957A	A	1428	1608		X		X	X		X	X	X	958	173202	W086.6	182536	E080.1
958A	A	1612	1751	X	X		X		X	X	X	X	959	191925	W113.4	201259	E053.2
959A	A	1756	1937	X	X		X		X	X	X	X	960	210647	W140.2	220022	E026.4
960A	A	1941	2124	X	X		X		X	X	X	X	961	225410	W167.1	234744	W000.5
961A	A	2128	2310	X	X		X		X	X	X	X					
9610	B	2309	0011				X		X	X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
23 AUGUST 1975

INT RBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
9620	A	0012	0210				X		X	X	X	X	962	004133	E166.1	013507	W027.3
964R	A	0221	0405	X	X		X		X	X	X	X	963	022856	E139.2	032229	W054.2
964R	B	0405	0454	X	X		X		X	X	X	X	964	041618	E112.4	050952	W081.0
965R	A	0501	0644	X	X		X		X	X	X	X	965	060341	E085.6	065715	W107.8
966A	A	0648	0825	X	X		X		X	X	X	X	966	075103	E058.7	084437	W134.7
967A	A	0828	1011	X	X		X		X	X	X	X	967	093826	E031.9	103200	W161.6
968A	A	1015	1158	X	X		X		X	X	X	X	968	112549	E005.0	121923	E171.6
969A	A	1202	1342	X	X		X		X	X	X	X	969	131312	W021.9	140646	E144.8
970A	A	1346	1528	X	X		X		X	X	X	X	970	150034	W048.7	155408	E117.9
971A	A	1532	1710	X	X		X		X	X	X	X	971	164757	W075.5	174131	E091.1
972A	A	1714	1855	X	X		X		X	X	X	X	972	183520	W102.4	192854	E064.2
973A	A	1859	2040	X	X		X		X	X	X	X	973	202242	W129.2	211616	E037.4
974A	A	2044	2226	X	X		X		X	X	X	X	974	221005	W156.1	230339	E010.5
9750	B	2225	2327				X		X	X	X	X	975	235728	E177.1	005102	W016.3

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
24 AUGUST 1975

INT RBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
9750	A	2328	0125				X		X	X	X	X	976	014450	E150.2	023824	W043.2
9760	A	0134	0314				X	X		X	X	X	977	033213	E123.4	042547	W070.0
977R	B	0314	0414	X	X		X	X	X	X	X	X	978	051936	E096.6	061310	W096.8
978R	A	0415	0559		X		X	X		X	X	X	979	070659	E069.7	080033	W123.7
979A	A	0604	0741		X		X	X		X		X	980	085421	E042.9	094755	W150.5
980A	A	0745	0927		X		X	X		X	X	X	981	104144	E016.0	113518	W177.4
981A	A	0931	1113		X		X	X		X	X	X	982	122907	W010.8	132241	E155.8
982A	A	1117	1301		X		X	X		X	X	X	983	141629	W037.7	151004	E129.0
983A	A	1305	1443		X		X	X		X	X	X	984	160352	W064.5	165726	E102.1
984A	A	1447	1626		X		X	X		X	X	X	985	175115	W091.3	184449	E075.2
985A	A	1630	1810		X		X	X		X	X	X	986	193838	W118.2	203212	E048.4
986A	A	1814	1956		X		X	X		X	X	X	987	212601	W145.1	221935	E021.6
987A	A	2001	2143		X		X	X		X	X	X	988	231324	W171.9	000658	W005.3
988A	A	2146	2330		X		X	X		X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
25 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
9880	B	2328	0033				X	X		X	X	X	989	010046	E161.3	015420	W032.1
9890	A	0032	0232				X	X		X	X	X	990	024809	E134.4	034143	W059.0
991R	A	0238	0425		X		X	X		X	X	X	991	043531	E107.6	052905	W085.8
991R	B	0423	0512		X		X	X		X	X	X	992	062254	E080.7	071628	W112.7
992R	A	0518	0703		X		X	X		X	X	X	993	081017	E053.9	090351	W139.5
993A	A	0707	0842		X		X	X		X	X	X	994	095740	E027.0	105114	W166.4
994A	A	0846	1029		X		X	X		X	X	X	995	114502	E000.2	123837	E166.8
995A	A	1033	1213		X		X	X		X	X	X	996	133225	W026.7	142559	E140.0
996A	A	1217	1400		X		X	X		X	X	X	997	151948	W053.5	161322	E113.1
997A	A	1405	1545		X		X	X		X	X	X	998	170711	W080.3	180045	E086.3
998A	A	1549	1727		X		X	X		X	X	X	999	185433	W107.2	194808	E059.4
999A	A	1731	1913		X		X	X		X	X	X	1000	204156	W134.0	213530	E032.6
1000A	A	1917	2100		X		X	X		X	X	X	1001	222919	W160.9	232253	E005.7
1001A	A	2104	2245		X		X	X		X	X	X					
10020	B	2244	2346				X	X		X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
26 AUGUST 1975

INT ORBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
10020	A	2347	0144				X	X		X	X	X	1002	001642	E172.3	011016	W021.1
10030	A	0153	0333				X	X		X	X	X	1003	020405	E145.4	025739	W048.0
1004R	B	0333	0431		X		X	X		X	X	X	1004	035128	E118.6	044502	W074.8
1005R	A	0431	0618		X		X	X		X	X	X	1005	053851	E091.7	063225	W101.7
1006A	A	0622	0759		X		X	X		X	X	X	1006	072614	E064.9	081948	W128.5
1007A	A	0803	0946		X		X	X		X	X	X	1007	091336	E038.1	100710	W155.3
1008A	A	0950	1134		X		X	X		X	X	X	1008	110059	E011.2	115433	E177.8
1009A	A	1138	1317		X		X	X		X	X	X	1009	124822	W015.6	134156	E151.0
1010A	A	1321	1503	X	X		X	X		X	X	X	1010	143545	W042.5	152919	E124.1
1011A	A	1507	1646	X	X		X		X	X	X	X	1011	162307	W069.3	171642	E097.3
1012A	A	1650	1830	X	X		X		X	X	X	X	1012	181030	W096.2	190404	E070.4
1013A	A	1834	2016	X	X		X		X	X	X	X	1013	195753	W123.0	205127	E043.6
1014A	A	2021	2202	X	X		X		X	X	X	X	1014	214516	W149.9	223850	E016.7
1015A	A	2207	2350	X	X		X		X	X	X	X	1015	233239	W176.7	002613	W010.1

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
27 AUGUST 1975

INT RBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
1018R	B	0229	0332	X	X		X		X	X	X	X	1016	012001	E156.4	021336	W037.0
1018R	A	0333	0531	X	X		X		X	X	X	X	1017	030724	E129.6	040058	W063.8
1019R	A	0538	0719	X	X		X		X	X	X	X	1018	045447	E102.8	054821	W090.6
1020A	A	0725	0902	X	X		X		X	X	X	X	1019	064210	E076.0	073544	W117.5
1021A	A	0906	1049	X	X		X		X	X	X	X	1020	082933	E049.1	092307	W144.3
1022A	A	1053	1234	X	X		X		X	X	X	X	1021	101656	E022.2	111030	W171.2
1023A	A	1238	1418	X	X		X		X	X	X	X	1022	120418	W004.6	125753	E162.0
1024A	A	1422	1602	X	X		X		X	X	X	X	1023	135141	W031.4	144515	E135.1
1025A	A	1606	1747	X	X		X		X	X	X	X	1024	153904	W058.3	163238	E108.3
1026A	A	1751	1931	X	X		X		X	X	X	X	1025	172627	W085.2	182001	E081.4
1027A	A	1935	2116	X	X		X		X	X	X	X	1026	191350	W112.0	200724	E054.6
1028A	A	2120	2304	X	X		X		X	X	X	X	1027	210113	W138.9	215447	E027.8
10290	B	2303	0006				X		X	X	X	X	1028	224835	W165.7	234210	E000.9

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
28 AUGUST 1975

INT RBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
10290	A	0006	0203				X		X	X	X	X	1029	003558	E167.5	012933	W025.9
10300	A	0213	0354				X		X	X	X	X	1030	022321	E140.6	031655	W052.8
1033A	B	0354	0450	X	X		X		X	X	X	X	1031	041044	E113.8	050418	W079.6
1032R	A	0448	0637	X	X		X		X	X	X	X	1032	055807	E086.9	065141	W106.5
1033A	A	0641	0819	X	X		X		X	X	X	X	1033	074530	E060.1	083904	W133.3
1034A	A	0823	1005	X	X		X		X	X	X	X	1034	093253	E033.2	102627	W160.2
1035A	A	1009	1151	X	X		X		X	X	X	X	1035	112015	E006.4	121350	E173.0
1036A	A	1155	1337	X	X		X		X	X	X	X	1036	130738	W020.5	140113	E146.1
1037A	A	1341	1522	X	X		X		X	X	X	X	1037	145501	W047.3	154835	E119.3
1038A	A	1526	1706		X		X	X		X	X	X	1038	164224	W074.2	173558	E092.5
1039A	A	1710	1847		X		X	X		X	X	X	1039	182947	W101.0	192321	E065.6
1040A	A	1851	2035		X		X	X		X	X	X	1040	201710	W127.8	211044	E038.8
1041A	A	2039	2221		X		X	X		X	X	X	1041	220433	W154.7	225807	E011.9
10420	B	2219	2322				X	X		X	X	X	1042	235156	E178.5	004530	W014.9
10420	A	2323	0121				X	X		X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
29 AUGUST 1975

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T H W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
10430	A	0130	0309				X	X		X	X	X	1043	013919	E151.6	023253	W041.8
1044R	B	0309	0407		X		X	X		X	X	X	1044	032641	E124.8	042016	W068.6
1045R	A	0408	0554		X		X	X		X	X	X	1045	051404	E097.9	060739	W095.5
1046A	A	0558	0734		X		X	X		X	X	X	1046	070127	E071.1	075502	W122.3
1047A	A	0737	0921		X								1047	084850	E044.2	094224	W149.2
1048A	A	0925	1106		X		X	X		X	X	X	1048	103613	E017.4	112947	W176.0
1049A	A	1111	1253		X		X	X		X	X	X	1049	122336	W009.5	131710	E157.2
1050A	A	1257	1437		X		X	X		X	X	X	1050	141059	W036.3	150433	E130.3
1051A	A	1441	1622		X		X	X		X	X	X	1051	155822	W063.1	165156	E103.5
1052A	A	1626	1805		X		X	X		X	X	X	1052	174545	W090.0	183919	E076.6
1053A	A	1809	1951		X		X	X		X	X	X	1053	193308	W116.9	202642	E049.8
1054A	A	1954	2138		X								1054	212031	W143.7	221405	E022.9
1055A	A	2142	2325		X								1055	230753	W170.5	000128	W003.9
10550	B	2323	0025				X	X		X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
30 AUGUST 1975

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T H W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
10560	A	0026	0224				X	X		X	X	X	1056	005516	E162.6	014851	W030.8
1058R	A	0236	0417		X		X	X		X	X	X	1057	024239	E135.8	033619	W057.6
1058R	B	0414	0509		X		X	X		X	X	X	1058	043002	E108.9	052337	W084.5
1059R	A	0512	0655		X		X	X		X	X	X	1059	061725	E082.1	071100	W111.3
1060A	A	0659	0838		X		X	X		X	X	X	1060	080448	E055.3	085823	W138.2
1061A	A	0842	1023		X		X	X		X	X	X	1061	095211	E028.4	104545	W165.0
1062A	A	1027	1210		X		X	X		X	X	X	1062	113934	E001.5	123308	E168.2
1063A	A	1214	1355		X		X	X		X	X	X	1063	132657	W025.3	142031	E141.3
1064A	A	1359	1538		X		X	X		X	X	X	1064	151420	W052.1	160754	E114.5
1065A	A	1542	1721	X	X		X		X	X	X	X	1065	170143	W079.0	175517	E087.6
1066A	A	1725	1907	X	X		X		X	X	X	X	1066	184906	W105.8	194240	E060.8
1067A	A	1911	2055	X	X		X		X	X	X	X	1067	203629	W132.7	213003	E034.0
1068A	A	2059	2242	X	X		X		X	X	X	X	1068	222352	W159.5	231726	E007.1
10690	B	2238	2341				X		X	X	X	X					

TABLE 2-2
DATA AVAILABILITY ON-OFF TIMES
31 AUGUST 1975

INT RBIT AND STDN	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LRIR	THIR	TDRE	SCAM	ESMR	ERB	PMR	TWRL	HIRS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
10690	A	2342	0140				X		X	X	X	X	1069	001115	E173.7	010449	W019.8
10700	A	0149	0328				X		X	X	X	X	1070	015838	E146.8	025212	W046.6
1071R	B	0329	0426	X	X		X		X	X	X	X	1071	034601	E120.0	043935	W073.5
1072R	A	0426	0613	X	X		X		X	X	X	X	1072	053324	E093.1	062658	W100.3
1073A	A	0617	0753	X	X		X		X	X	X	X	1073	072047	E066.3	081421	W127.1
1074A	A	0757	0940	X	X		X		X	X	X	X	1074	090810	E039.4	100144	W154.0
1075A	A	0945	1129	X	X		X		X	X	X	X	1075	105533	E012.6	114907	E179.2
1076A	A	1133	1312	X	X		X		X	X	X	X	1076	124256	W014.3	133630	E152.3
1077A	A	1316	1457	X	X		X		X	X	X	X	1077	143019	W041.1	152353	E125.5
1078A	A	1501	1639	X	X		X		X	X	X	X	1078	161742	W068.0	171116	E098.6
1079A	A	1638	1825	X	X								1079	180505	W094.8	185839	E071.8
													1080	195228	W121.7	204602	E044.9
													1081	213951	W148.5	223325	E018.1
													1082	232714	W175.4	002048	E008.8

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

SECTION 3

IMAGE DISPLAYS OF HIRS, SCAMS, AND ESMR

This section briefly describes the HIRS, SCAMS and ESMR experiments, explains the formats of the image displays derived from the data of these three experiments, and presents image examples from each of them. Complete descriptions of the HIRS, SCAMS and ESMR experiments are found in Sections 3, 4, and 5, respectively, of The Nimbus 6 User's Guide.

The HIRS is a 17-channel radiometer. Sixteen channels have central wavelengths between 3.7 μm and 15 μm, and one is centered at 0.69 μm to measure reflected sunlight. Spatial resolution at the nadir on the earth's surface is about 25 km (13 n. m.).

The SCAMS is a 5-channel scanning radiometer. Channel 1 lies on a water vapor line near 22 GHz. Channel 2 is on an atmospheric window near 32 GHz. Channels 3, 4, and 5 are within the oxygen band near 54 GHz. Spatial resolution varies from about 145 km (80 n. m.) near nadir to about 330 km (180 n. m.) at the scan limits.

The ESMR is a two-channel scanning radiometer receiving microwave radiation in a 250 MHz band centered at 37 GHz. One channel is used to measure the vertical polarization of the radiation, and the other measures the horizontal polarization. The antenna beam scans ahead of the spacecraft along a conical surface with a constant angle of 45 degrees with respect to the antenna axis. Spatial resolution of each element is about 20 km in the cross-track direction by 45 km in the direction parallel to the subpoint track.

All HIRS, SCAMS, and ESMR data are converted to 4" × 5" black and white images. Selected images from each experiment from July and August 1975 are presented in this section. Complete coverage times for each experiment are listed in the Data Availability On-Off Times in Table 2-2.

Sections 3, 4, and 5 of The Nimbus 6 User's Guide describe in detail the image formats of the HIRS, SCAMS, and ESMR. The following is a summary of the format, detailing changes to the User's Guide where needed. Each display contains the following similar items:

- NIMBUS 6 (HIRS, SCAMS, or ESMR)

  This identifies the satellite and the experiment

- (DATE)

  This identifies the Greenwich month, day, and year the data were recorded on board the satellite.

- SCALE F

All data from the three experiments have been displayed in the F (full-scale) mode. For each experiment the data from each interrogation orbit is displayed on a single image. Each HIRS scan line is displayed once. Each of the 42 scan-spot elements across a scan is displayed four times. Each SCAMS scan line is displayed three times in succession. Each of the 13 scan-spot elements across a scan line is displayed ten times. Each ESMR scan line is displayed once. Each of the 71 scan-spot elements is displayed once.

- INT ORBIT

The interrogation orbit number identifies the orbit in progress when the recorded data is transmitted to a STDN station. Usually parts of two data orbits are on the same display. The interrogation orbit number will only identify the last orbit of each display.

- TIME (and) SUBPOINT

Satellite time and latitude-longitude information are presented along the vertical line down the center of each display. The line represents the satellite subpoint track, which is located down the center of each of the swaths on each display. Time is GMT with ticks along the left side of the line at each five minute mark (on the five minutes). Time is annotated (hour and minute) every 15 minutes (on the quarter hour).

Subpoint information presents latitude and longitude positions of the satellite subpoint. Each tick mark on the right side of the vertical line is annotated with the subpoint latitude and longitude (to the nearest degree). Latitude is labeled N (north) or S (south). Longitude is labeled E (east) or W (west).

- GRAY SCALE

Each image has an 18-step gray scale along the bottom of the display. The gray scales are used to define parameter value intervals for each image swath of each display by assigning different parameter values to the gray scale for each swath. Tables 3-1 through 3-5 define the parameter values versus gray scale for each HIRS, SCAMS, and ESMR image swath.

- 3200

This identifies the computer used to process the data. All data was processed by the Control Data Corporation (CDC) 3200.

Table 3-1

Temperature Range of Gray Scale, and Channel of HIRS Data for each Swath on each HIRS Image Display between Orbit 426 and 1082 (14 July through 31 August 1975)

		SWATH NUMBER									
		1	2	3	4	5	6	7	8	9	10
Coverage Period 14 July-20 July Orbits 426-513	HIRS Channel Display (channel-range)*	08-08	09-09	10-10	16-16	17-17	18-18	12-12	14-14	03-03	15-15
	Temperature Range (°K) (black to white)	300-200	290-210	260-210	310-270	100-900	0-30	290-210	260-210	240-210	280-210
Coverage Period 22 July-31 July Orbits 538-545 548-549 600-613 615-647 651-657 659	HIRS Channel Display (channel-range)*	08-08	09-09	10-10	16-16	17-17	17-17	12-12	14-14	03-03	15-15
	Temperature Range (°K) (black-white)	300-200	290-210	260-230	310-270	100-900	100-900	280-200	280-200	280-200	280-200
Coverage Period 23 July-6 Aug. Orbits 546-547 553-599 614 648-650 658 660-747	HIRS Channel Display (channel-range)*	08-08	16-16	16-21	18-18	17-17	10-10	12-12	14-14	03-03	15-15
	Temperature Range (°K) (black-white)	300-200	310-270	300-200	0-30	100-900	260-230	280-200	280-200	280-200	280-200
Coverage Period 7 Aug.-31 Aug. Orbits 748-1082	HIRS Channel Display (channel-range)*	08-08	16-16	16-21	18-18	17-17	10-10	12-12	14-14	03-03	15-15
	Temperature Range (°K) (black-white)	310-230	310-230	310-270	0-50	100-900	280-210	300-210	300-210	240-185	300-185

*The HIRS channel number is number before the hyphen. The number after the hyphen is the computer program table used to display the data from each channel as temperatures (°K). The range of temperatures displayed in each swath is given beneath each "HIRS Channel Display". The 18 steps of the gray scale are used to represent the division of each temperature range into 18 approximately equal temperature intervals. The central wavelength (in μm) of each channel on these displays is: 3 = 14.4, 8 = 11.0, 9 = 8.2, 10 = 6.7, 12 = 4.52, 14 = 4.40, 15 = 4.24, 16 = 3.71, 17 = 0.61, and 18 is the temperature difference between channel 16 and channel 8. The values of channel 17-17 are albedo, represented as "counts" between 100 (blackest) and 900 (whitest). The values for 16-21 represent a second temperature range for channel 16 data. Table 3-1 on page 39 of the User's Guide provides detailed spectral information and the purpose of each of the HIRS channels.

Table 3-2

Parameter Value for each Step of the Gray Scale on the SCAMS Image Displays for Parameters 2, 3, 11, 12, and 16 Between Orbit 426 and 1082 (14 July through 31 August 1975)

	Parameters					
Gray Scale Number	2 (31.65 GHz T_A) (°K)	3 (52.85 GHz T_A) (°K)	11 (Integrated water vapor) (g/mm^2)	12* (Integrated) liquid water) (g/mm^2)	12** (Integrated liquid water) (g/mm^2)	16 (param. 2) minus (param. 3) (°K)
(black) 1	> 320	> 280	> 60	> 1.6	> 1.5	> 10
2	306 - 320	276 - 280	56 - 60	1.5 - 1.6	1.4 - 1.5	08 - 10
3	293 - 306	271 - 276	53 - 56	1.4 - 1.5	1.3 - 1.4	06 - 08
4	279 - 293	267 - 271	49 - 53	1.3 - 1.4	1.2 - 1.3	04 - 06
5	265 - 279	263 - 267	45 - 49	1.2 - 1.3	1.1 - 1.2	02 - 04
6	251 - 265	258 - 263	41 - 45	1.1 - 1.2	1.0 - 1.1	00 - 02
7	238 - 251	254 - 258	38 - 41	1.0 - 1.1	0.9 - 1.0	-02 - 00
8	224 - 238	249 - 254	34 - 38	0.9 - 1.0	0.8 - 0.9	-04(-) - 02
9	210 - 224	245 - 249	30 - 34	0.8 - 0.9	0.7 - 0.8	-06(-) - 04
10	196 - 210	241 - 245	26 - 30	0.7 - 0.8	0.6 - 0.7	-08(-) - 06
11	183 - 196	236 - 241	23 - 26	0.6 - 0.7	0.5 - 0.6	-10(-) - 08
12	169 - 183	232 - 236	19 - 23	0.5 - 0.6	0.4 - 0.5	-12(-) - 10
13	155 - 169	228 - 232	15 - 19	0.4 - 0.5	0.3 - 0.4	-14(-) - 12
14	141 - 155	223 - 228	11 - 15	0.3 - 0.4	0.2 - 0.3	-16(-) - 14
15	128 - 141	219 - 223	08 - 11	0.2 - 0.3	0.1 - 0.2	-18(-) - 16
16	114 - 128	214 - 219	04 - 08	0.1 - 0.2	0.0 - 0.1	-20(-) - 18
17	100 - 114	210 - 214	00 - 04	0.0 - 0.1	-0.1 - 0.0	-22(-) - 20
(white) 18	< 100	< 210	< 00	< 0.0	<-0.1	< -22

*valid between orbits 426 and 477
**valid between orbits 478 and 1082

While the preceeding format information is similar for HIRS, SCAMS, and ESMR, the swath displays of the data from each experiment are different. Therefore, the following information describes the swath displays for each experiment for this catalog period.

HIRS CHANNEL - RANGE Displays

Each of the ten swaths on the HIRS displays is described by a "CHANNEL (and) RANGE". The CHANNEL is the HIRS channel number (1 through 17), and the RANGE is the computer program table used to display the data from each channel as temperatures (°K). The CHANNEL-RANGE programs used during this catalog period are listed in Table 3-1. The HIRS displays shown in Section 3.1 are examples of the data displayed from each orbit during this period.

Table 3-3

Contour Program Options used for Parameters 13, 14, and 15 on the SCAMS Image Displays Between Orbit 426 and 1082 (14 July through 31 August 1975)

Contour options	Parameters			Valid for orbits
	13 Mean temperature between 1000 mb and 500 mb	14 Mean temperature between 500 mb and 250 mb	15 Mean temperature between 250 mb and 100 mb	
Contour interval	4°K	4°K	4°K	426-851
Contour thickness	1°K	1°K	1°K	(14 July - 14 August)
Contour interval	4°K	4°K	4°K	852-1082
Contour thickness	2°K	2°K	2°K	(14 August - 31 August)

SCAMS PARAMETER DISPLAYS

The SCAMS displays currently contain eight vertical swaths of data, as shown in the SCAMS figures in Section 3.2. Each swath is labeled with a parameter number. All the displays for this catalog period display the same parameters. All swaths contain the same coverage information, but each contains different spectral or temperature information. The values of the gray scale for each image swath are shown in Table 3-2. The parameter values for the contoured swaths are given in Table 3-3.

Parameters 2, 3, and 16 represent uninverted antenna temperatures. Parameters 2 and 3 represent the antenna temperatures (T_A) for channels 2 (31.65 GHz) and 3 (52.85 GHz). Parameter 16 is the temperature difference between channel 2 and 3.

Parameters 16 and 2 are sensitive to surface characteristics such as ice and snow cover and soil moisture content, as well as the obvious difference in emissivity between land and water. Parameter 3 is principally a measure of lower tropospheric temperature, but is significantly perturbed by surface emissivity and to some extent by atmospheric water vapor and precipitation.

Parameters 11 and 12 represent inverted antenna temperatures. Parameter 11 portrays the integrated atmospheric water vapor and parameter 12 portrays the integrated liquid water from clouds or precipitation. These two parameters are valid only over the oceans.

Table 3-4

Brightness Temperature Value for each Step of the Gray Scale on ESMR Image Displays for Orbits 426 through 827 (14 July through 12 August 1975) (Brightness Temperatures are in °K)

Gray Scale Number	Swath Number and ESMR Display Parameter									
	1 and 11 (T_H)	2 and 12 (T_V)	3 and 13 $\left(\frac{T_H+T_V}{2}\right)$	4 and 14 (T_H)	5 and 15 (T_V)	6 and 16 $\left(\frac{T_H+T_V}{2}\right)$	7 and 17 (T_H)	8 and 18 (T_V)	9 and 19 $\left(\frac{T_H+T_V}{2}\right)$	10 and 20 (T_V-T_H)
(black) 1	> 200			> 250			> 300			> 50
2	196-200	same	same	246-250	same	same	296-300	same	same	46-50
3	193-196	as	as	243-246	as	as	293-296	as	as	43-46
4	190-193	1 and 11	1 and 11	240-243	4 and 14	4 and 14	290-293	7 and 17	7 and 17	40-43
5	187-190			237-240			287-290			37-40
6	184-187			234-237			284-287			34-37
7	181-184			231-234			281-284			31-34
8	178-181			228-231			278-281			28-31
9	175-178			225-228			275-278			25-28
10	171-175			221-225			271-275			21-25
11	168-171			218-221			268-271			18-21
12	165-168			215-218			265-268			15-18
13	162-165			212-215			262-265			12-15
14	159-162			209-212			259-262			09-12
15	156-159			206-209			256-259			06-09
16	153-156			203-206			253-256			03-06
17	150-153			200-203			250-253			00-03
(white) 18	< 150			< 200			< 250			< 00

T_H = Brightness temperature derived from the ESMR horizontal polarization channel data

T_V = Brightness temperature derived from the ESMR vertical polarization channel data

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Table 3-5

Brightness Temperature Value for each Step of the Gray Scale on ESMR Image Displays for Orbits 828 through 1082 (13 August through 31 August 1975) (Brightness Temperatures are in °K)

Gray Scale Number	Swath Number and ESMR Display Parameter									
	1 and 11 (T_H)	2 and 12 (T_V)	3 and 13 $\left(\frac{T_H+T_V}{2}\right)$	4 and 14 (T_H)	5 and 15 (T_V)	6 and 16 $\left(\frac{T_H+T_V}{2}\right)$	7 and 17 (T_H)	8 and 18 (T_V)	9 and 19 $\left(\frac{T_H+T_V}{2}\right)$	10 and 20 (T_V-0.6T_H)
(black) 1	> 200	> 230	> 210	> 250	> 270	> 250	> 290	> 300	> 280	>140
2	196-200	226-230	206-210	246-250	267-270	247-250	287-290	298-300	278-280	136-140
3	191-196	223-226	203-206	243-246	264-267	244-247	284-287	295-298	275-278	133-136
4	187-191	219-223	199-203	239-243	261-264	241-244	281-284	293-295	273-275	129-133
5	183-187	215-219	195-199	235-239	258-261	238-241	278-281	290-293	270-273	125-129
6	178-183	211-215	191-195	231-235	254-258	234-238	274-278	288-290	268-270	121-125
7	174-178	208-211	188-191	228-231	251-254	231-234	271-274	285-288	265-268	118-121
8	169-174	204-208	184-188	224-228	248-251	228-231	268-271	283-285	263-265	114-118
9	165-169	200-204	180-184	220-224	245-248	225-228	265-268	280-283	260-263	110-114
10	161-165	196-200	176-180	216-220	242-245	222-225	262-265	278-280	258-260	106-110
11	156-161	193-196	173-176	213-216	239-242	219-222	259-262	275-278	255-258	103-106
12	152-156	189-193	169-173	209-213	236-239	216-219	256-259	273-275	253-255	99-103
13	148-152	185-189	165-169	205-209	233-236	213-216	253-256	270-273	250-253	95-99
14	143-148	181-185	161-165	201-205	229-233	209-213	249-253	268-270	248-250	91-95
15	139-143	178-181	158-161	198-201	226-229	206-209	246-249	265-268	245-248	88-91
16	134-139	174-175	154-158	194-198	223-226	203-206	243-246	263-265	243-245	84-88
17	130-134	170-174	150-154	190-194	220-223	200-203	240-243	260-263	240-243	80-84
(white) 18	< 130	< 170	< 150	< 190	< 220	< 200	< 240	< 260	< 240	< 80

T_H = Brightness temperature derived from the ESMR horizontal polarization data

T_V = Brightness temperature derived from the ESMR vertical polarization data

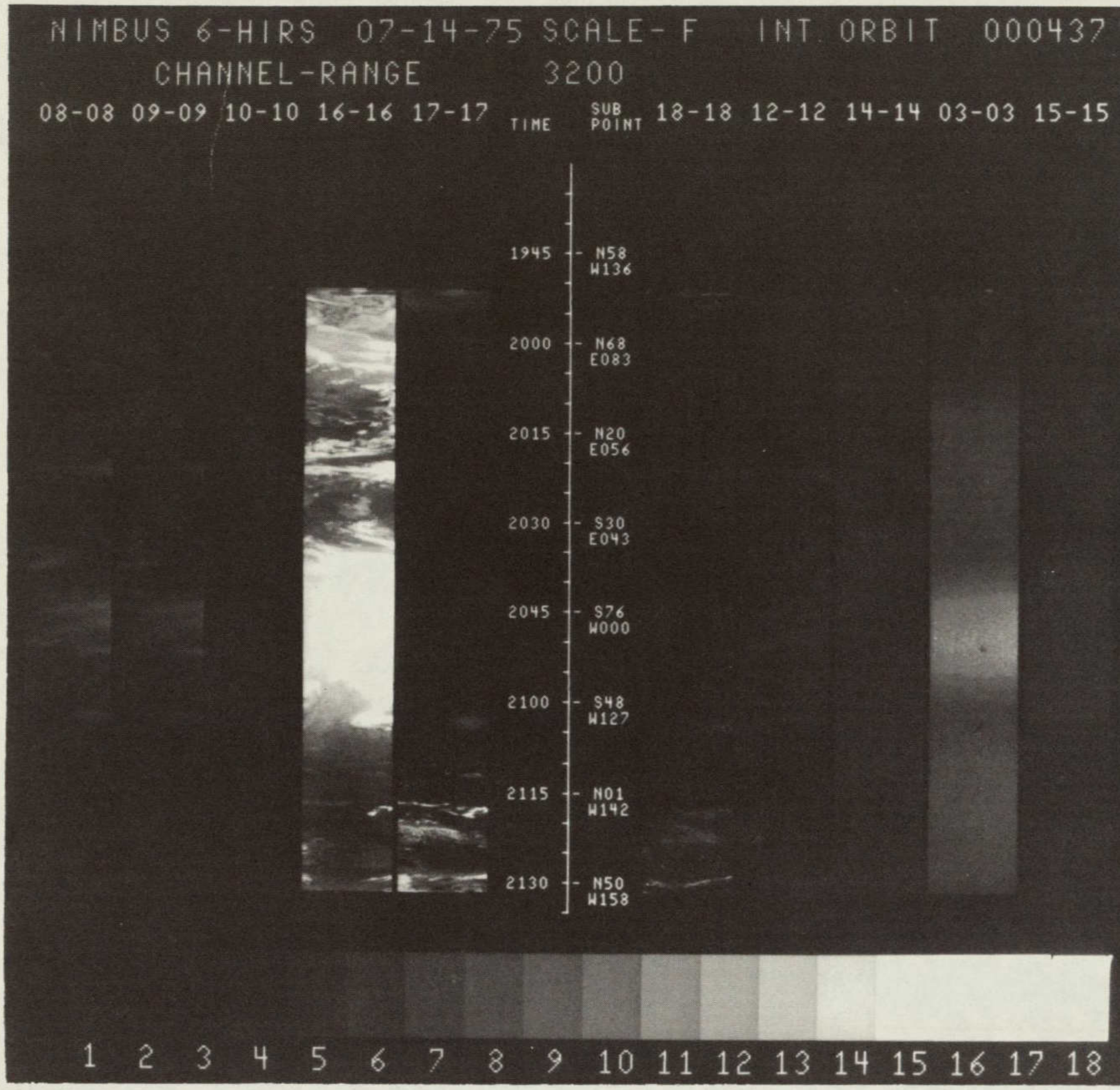
Only SCAMS channels 1 and 2 were used to estimate these two parameters. The data are inverted by a statistical method and the parameters are computed by linear operations on the antenna temperatures for each scan angle separately.

In the displays for orbits 539 through 777, vertical stripes appear in the parameter 12 image. These stripes resulted from retention of insufficient precision in the inversion.

Parameters 13, 14, and 15 are mean temperatures (averaged over the logarithm of pressure) for the atmospheric layers between 1000 mb and 500 mb, 500 mb and 250 mb, and 250 mb and 100 mb, respectively. These temperatures are displayed by contour bands. The bands are spaced 4 degrees K apart, with alternate bands a darker shade of gray (although in some cases problems in photographic processing caused both shades to be saturated white). Prior to orbit 852, (14 August) the bands were approximately 1 degree thick. After this orbit, the thickness was increased to about 2 degrees, so that contour boundaries (between black and gray or white) are evenly spaced at about 2 degree intervals. Each band is labeled, space permitting, with the lowest temperature value within it, i.e., its lower boundary. Prior to orbit 778, (9 August) parameters 13, 14, and 15 were estimated using only the data from SCAMS channels 3, 4, and 5. The coefficients used in the calculations were determined under the assumption of an ocean surface, so the resulting values were incorrect over land. Starting with orbit 778, channels 1 and 2 were also incorporated into the inversion to correct for the effects of surface emissivity and water vapor. However, there is no correction for surface elevation, so mountains and plateaus still introduce errors in the estimated values.

ESMR CHANNEL - RANGE Displays

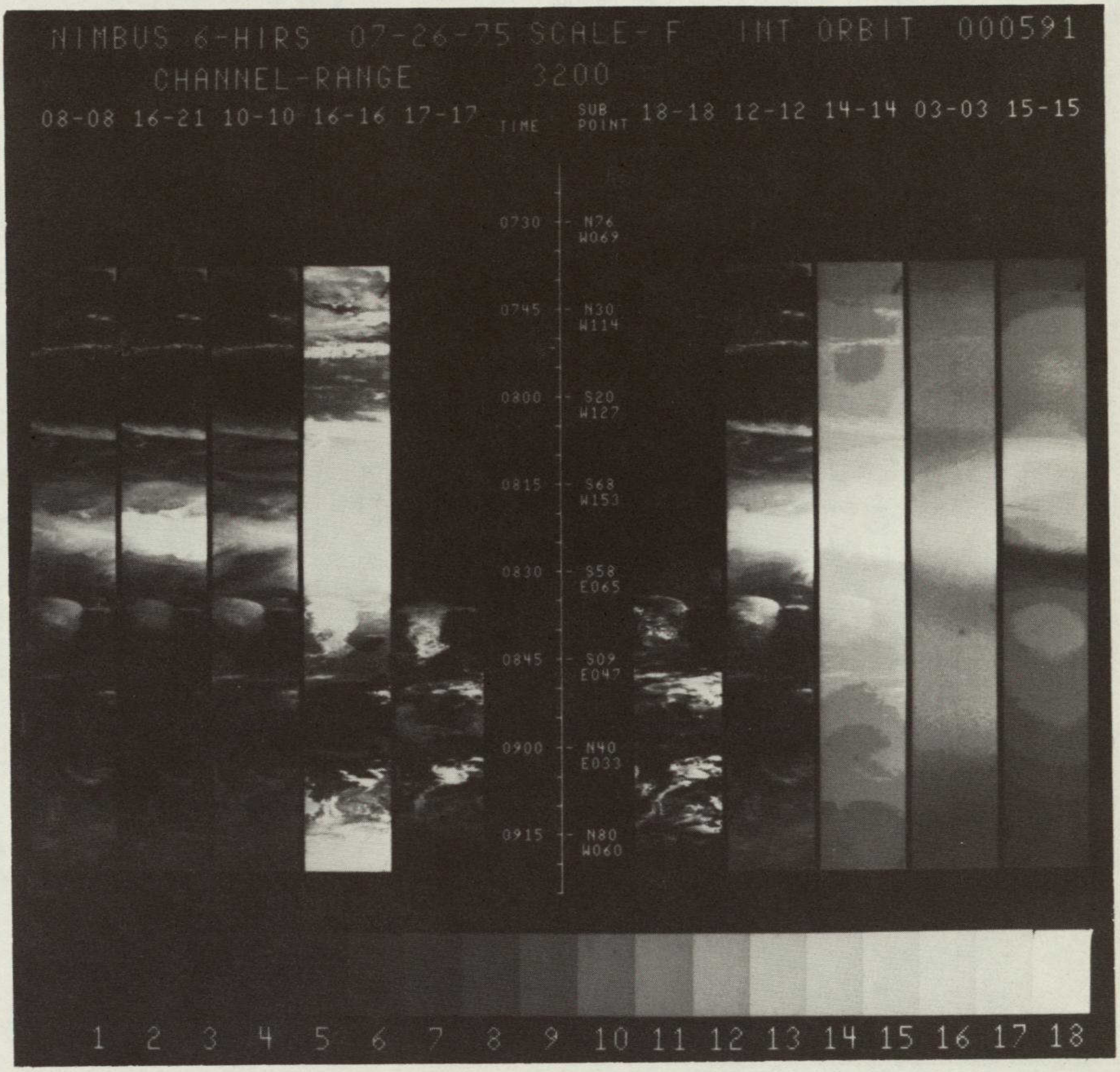
The ESMR displays contain 20 swaths of data, as shown in the ESMR figures in Section 3.3. Swath number 1 is on the far left, with the swath numbers incrementing to swath number 20 on the far right. The left set of ten swaths and their SUBPOINT-TIME line have the same geographic coverage. However, each swath displays either horizontally or vertically polarized data and a temperature range as listed in Tables 3-4 and 3-5. The right set of ten swaths and their SUBPOINT-TIME line have a similar format. These ten swaths display the earliest recorded data. If these swaths were cut and placed above the group on the left, the new display would show the continuous coverage recorded for that orbit. While the geographic coverage is different for each set of ten swaths, the temperature and polarization information are similar. That is, the temperature range and the polarization for swath 1 is the same as for swath 11; similarly, swaths 2 and 12 are the same, etc. Tables 3-4 and 3-5 are set up to show this duplication.


NIMBUS 6-HIRS 07-14-75 SCALE- F INT ORBIT 000437
CHANNEL-RANGE 3200
08-08 09-09 10-10 16-16 17-17 TIME SUB POINT 18-18 12-12 14-14 03-03 15-15
1945 N58 W136
2000 N68 E083
2015 N20 E056
2030 S30 E043
2045 S76 W000
2100 S48 W127
2115 N01 W142
2130 N50 W158
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

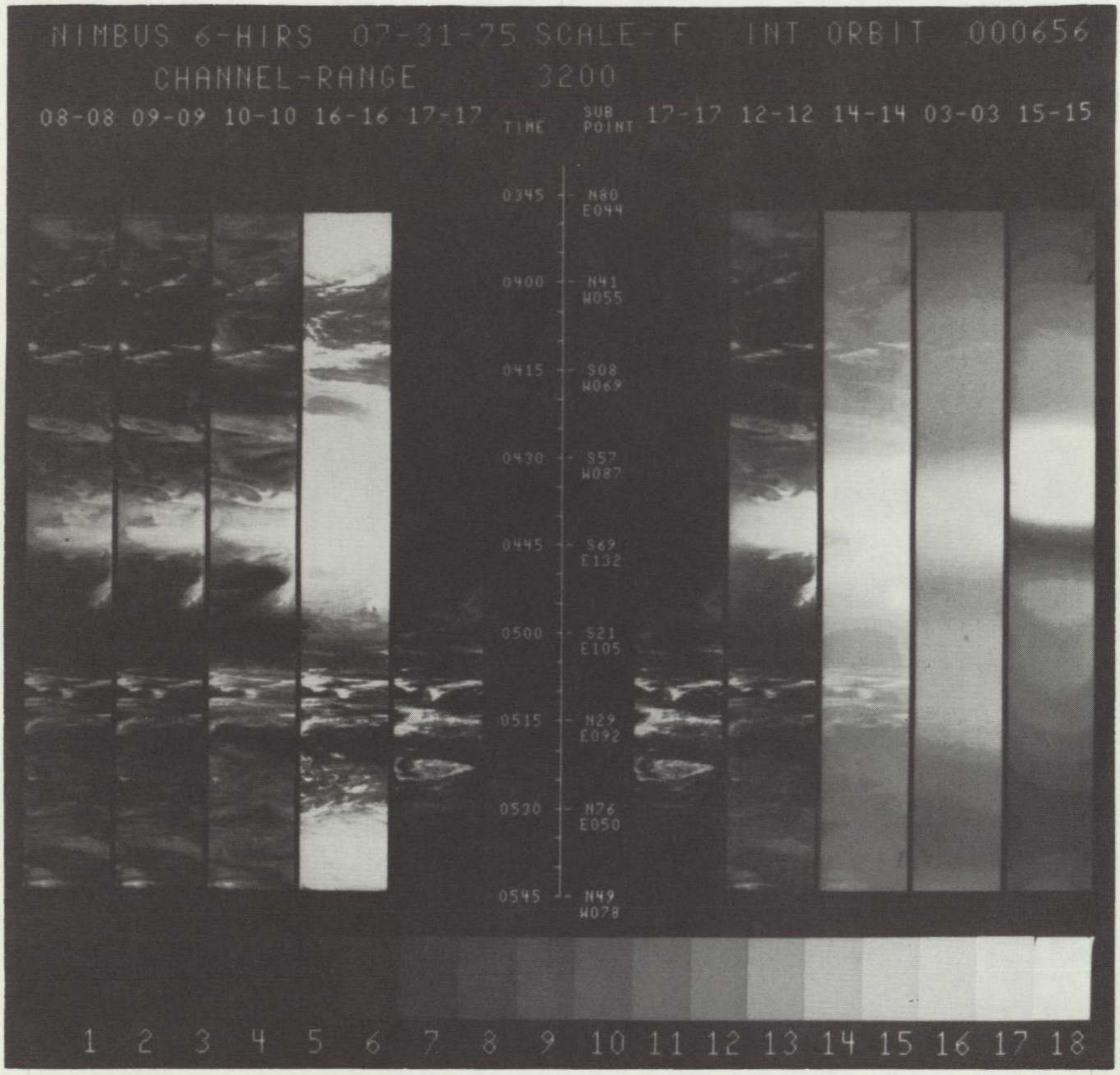
SECTION 3.1

SELECTED HIRS IMAGE DISPLAYS

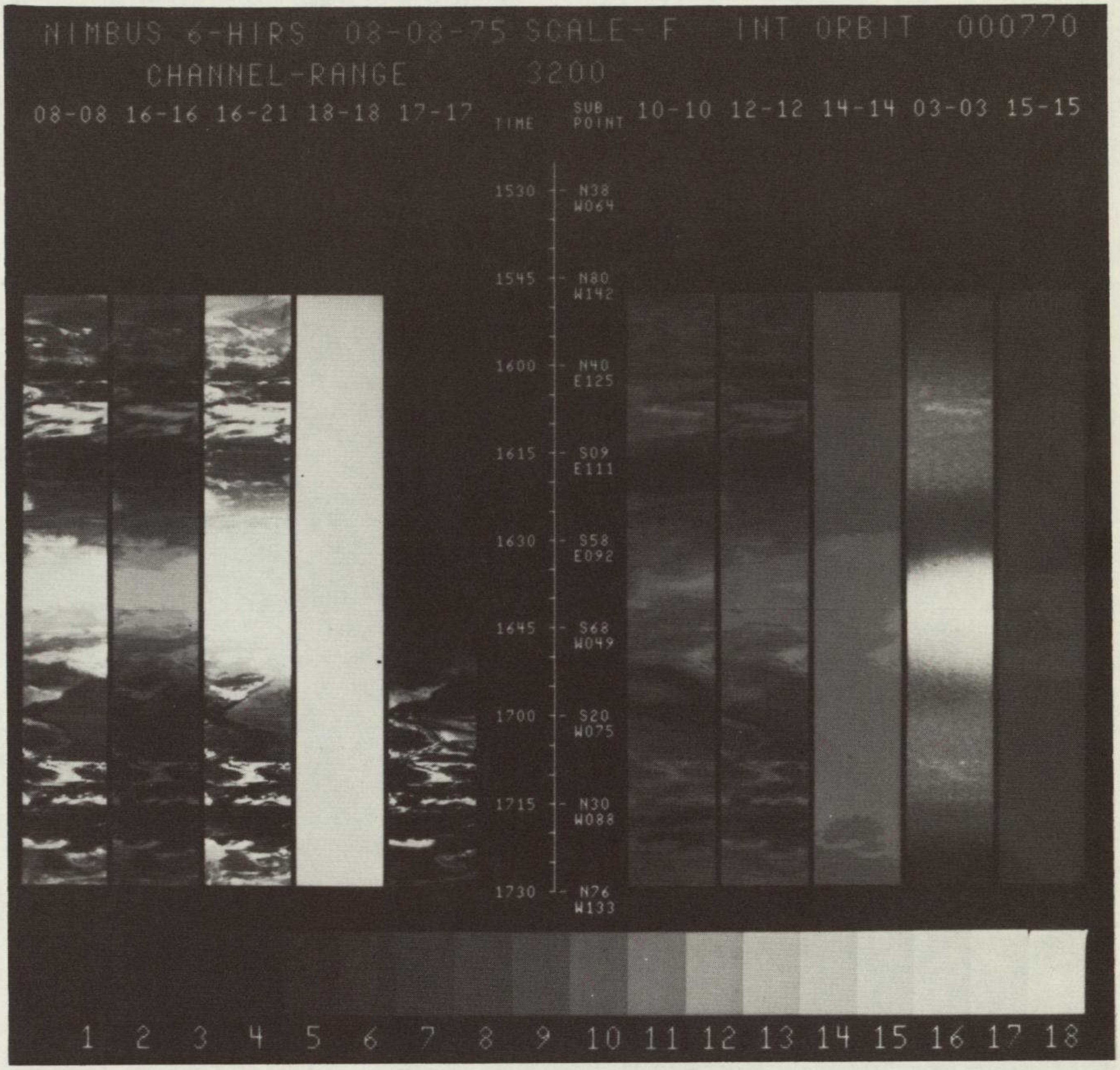
(The same orbits of SCAMS and ESMR images are shown in Sections 3.2 and 3.3, respectively.)

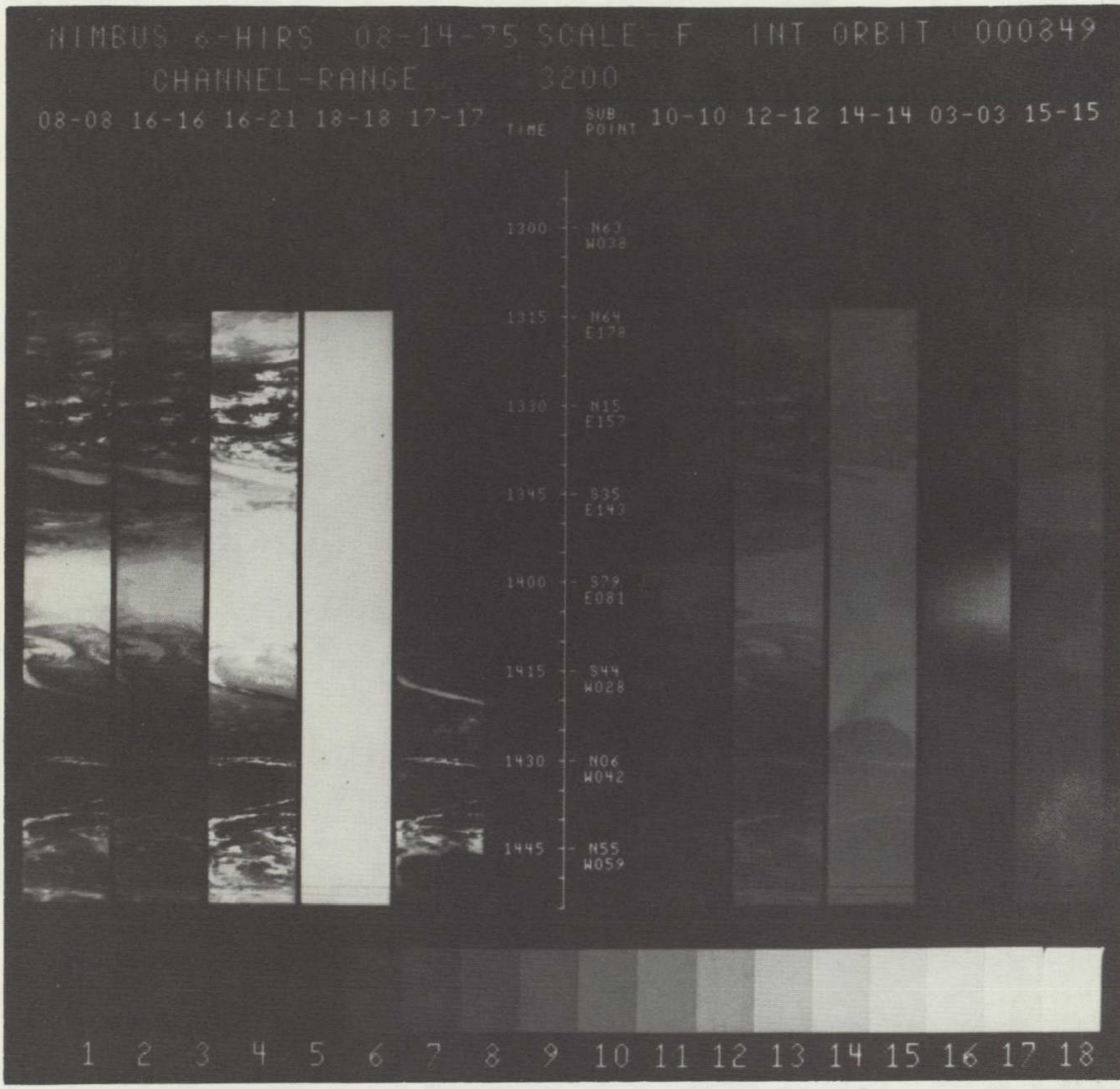


NIMBUS 6-HIRS 07-26-75 SCALE-F INT ORBIT 000591
CHANNEL-RANGE 3200
08-08 16-21 10-10 16-16 17-17
TIME
SUB POINT
18-18 12-12 14-14 03-03 15-15
0730 N76 W069
0745 N30 W114
0800 S20 W127
0815 S68 W153
0830 S58 E065
0845 S09 E047
0900 N40 E033
0915 N80 W060
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

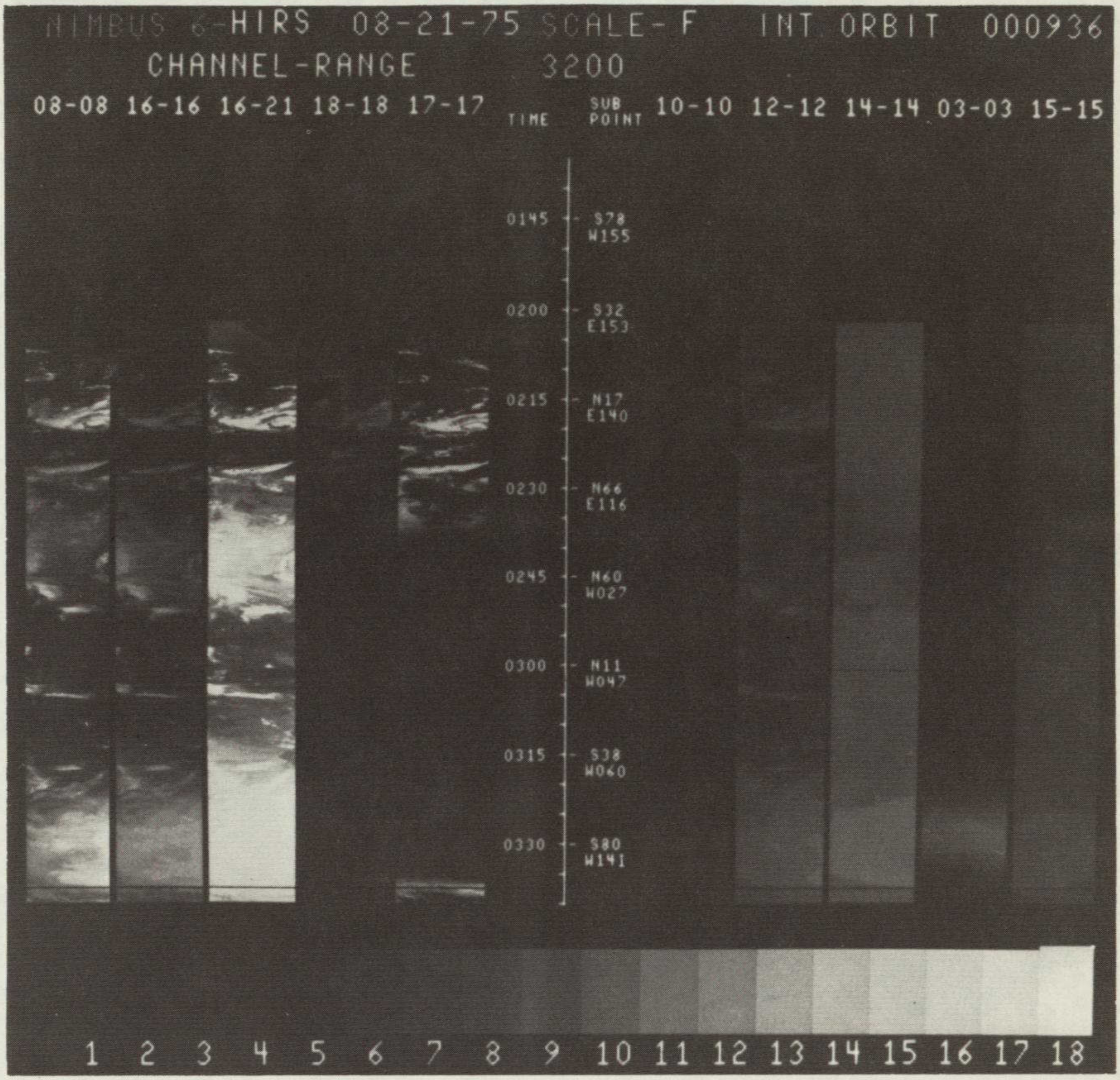


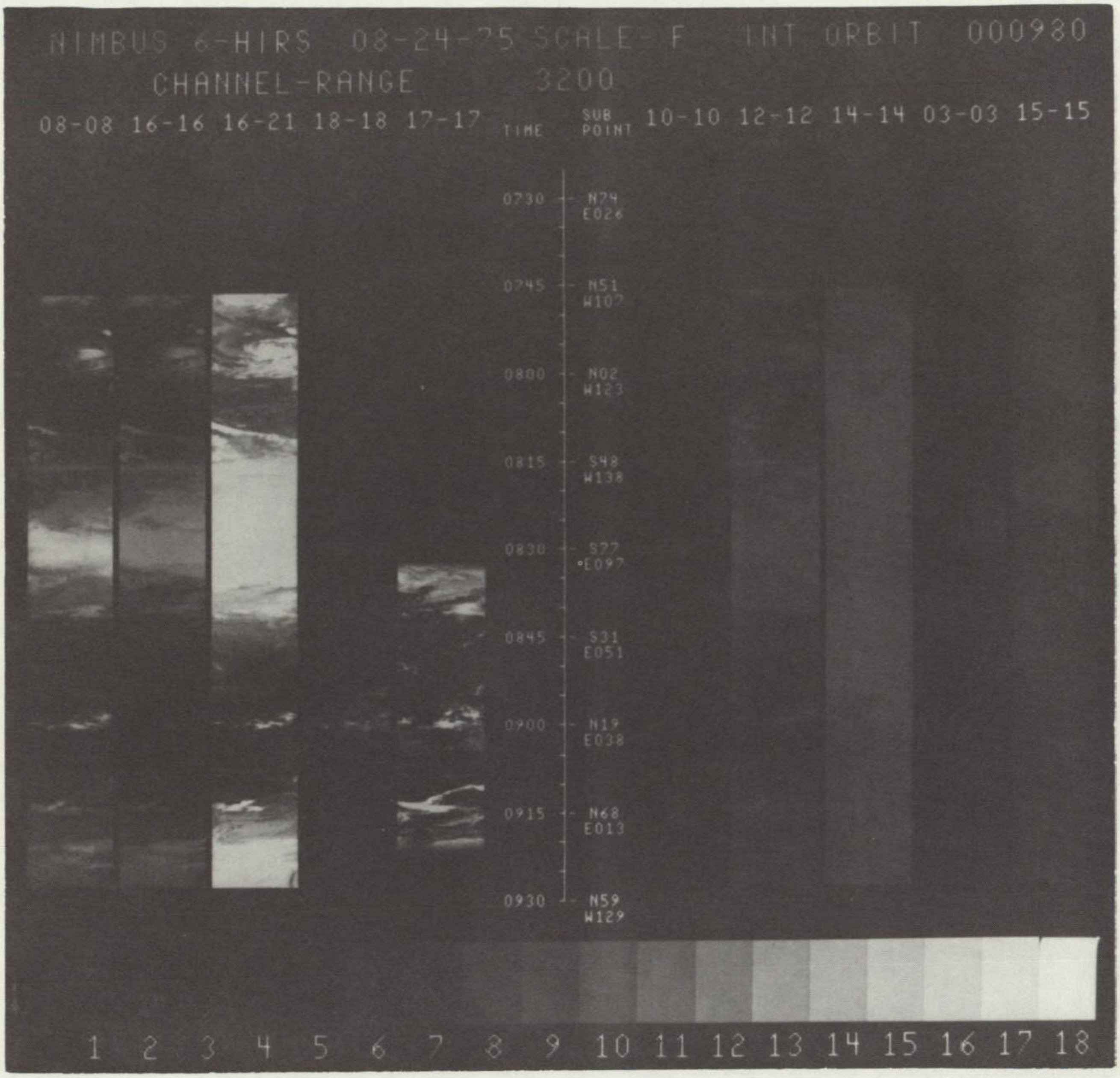
NIMBUS 6-HIRS 07-31-75 SCALE-F INT ORBIT 000656
CHANNEL-RANGE 3200
08-08 09-09 10-10 16-16 17-17 TIME SUB POINT 17-17 12-12 14-14 03-03 15-15
0345 N80 E044
0400 N41 W055
0415 S08 W069
0430 S57 W087
0445 S69 E132
0500 S21 E105
0515 N29 E092
0530 N76 E050
0545 N49 W078
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

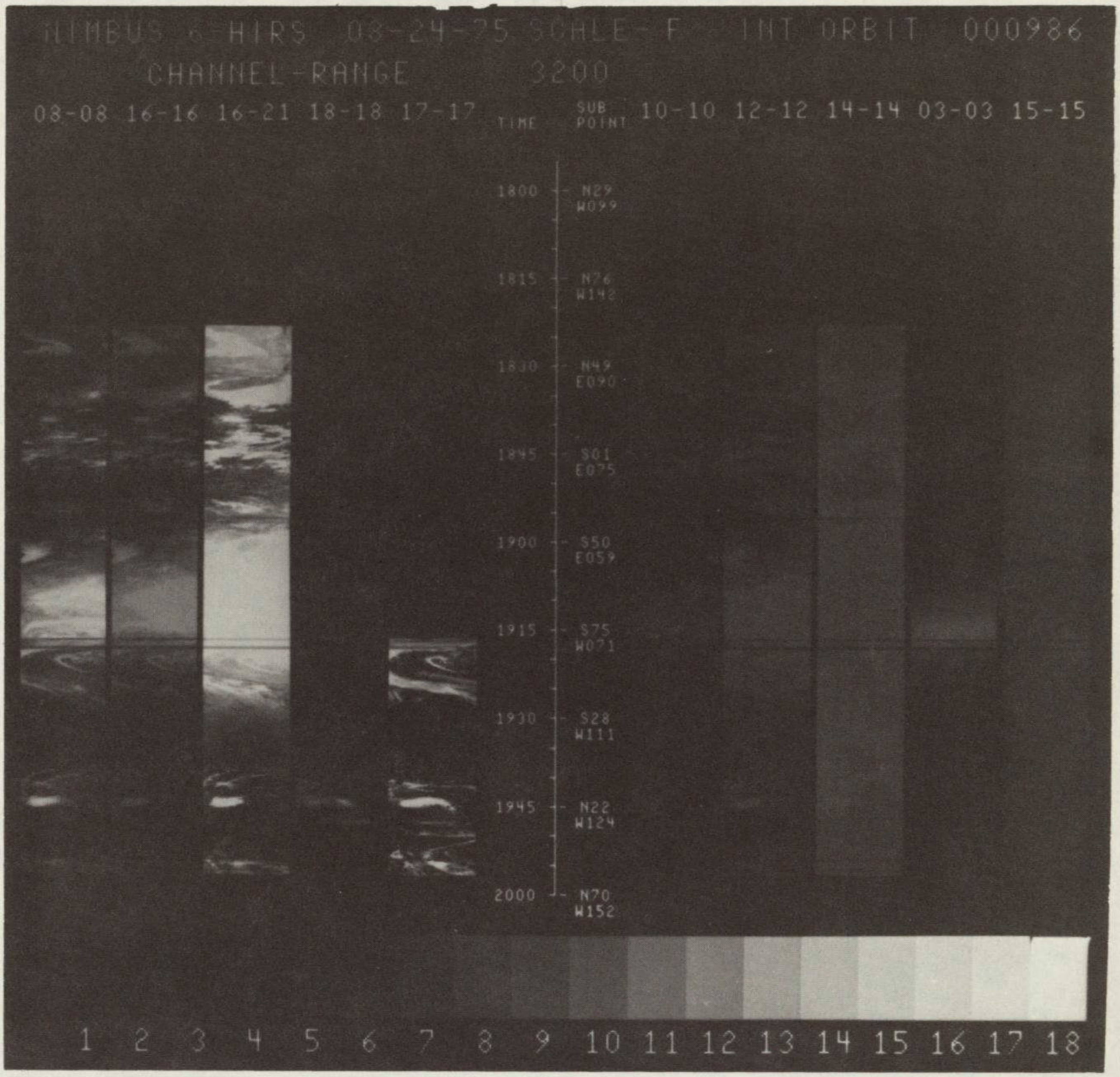

NIMBUS 6-HIRS 08-08-75 SCALE-F INT ORBIT 000770
CHANNEL-RANGE 3200
08-08 16-16 16-21 18-18 17-17
TIME
SUB POINT
10-10 12-12 14-14 03-03 15-15
1530 N38 W064
1545 N80 W142
1600 N40 E125
1615 S09 E111
1630 S58 E092
1645 S68 W049
1700 S20 W075
1715 N30 W088
1730 N76 W133
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

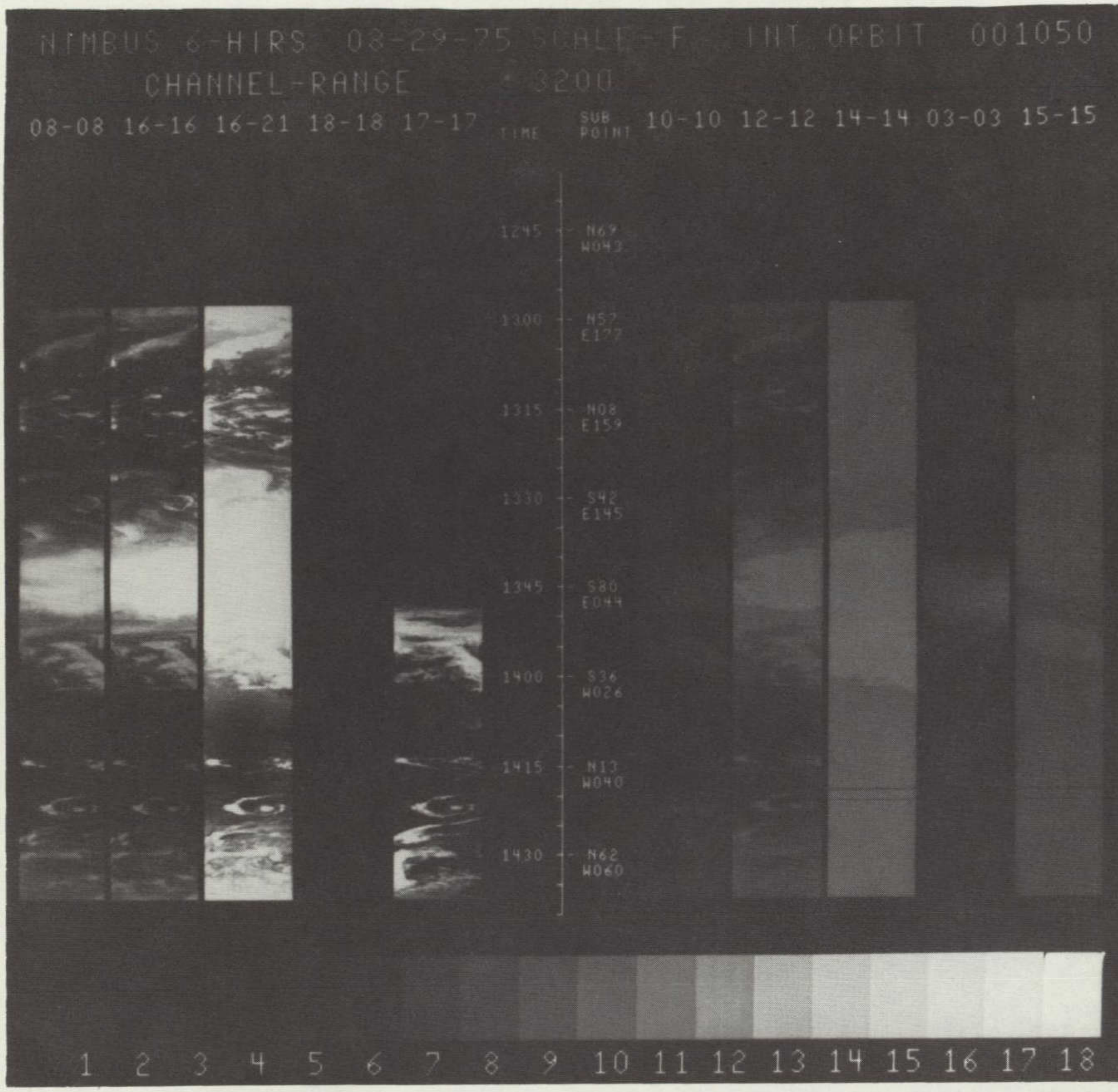


NIMBUS 6-HIRS 08-14-75 SCALE F INT ORBIT 000349
CHANNEL-RANGE 3200
08-08 16-16 16-21 18-18 17-17
TIME
SUB POINT
10-10 12-12 14-14 03-03 15-15
1300 N63 W038
1315 N64 E178
1330 N15 E157
1345 S35 E143
1400 S79 E081
1415 S44 W028
1430 N06 W042
1445 N55 W059
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18


NIMBUS 6-HIRS 08-21-75 SCALE-F INT ORBIT 000936
CHANNEL-RANGE 3200
08-08 16-16 16-21 18-18 17-17
TIME
SUB POINT
10-10 12-12 14-14 03-03 15-15
0145 S78 W155
0200 S32 E153
0215 N17 E140
0230 N66 E116
0245 N60 W027
0300 N11 W047
0315 S38 W060
0330 S80 W141
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18


NIMBUS 6-HIRS 08-24-75 SCALE-F INT ORBIT 000980
CHANNEL-RANGE 3200
08-08 16-16 16-21 18-18 17-17
TIME
SUB POINT
10-10 12-12 14-14 03-03 15-15
0730 N74 E026
0745 N51 W107
0800 N02 W123
0815 S48 W138
0830 S77 E097
0845 S31 E051
0900 N19 E038
0915 N68 E013
0930 N59 W129
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18


NIMBUS 6 HIRS 08-24-75 SCALE-F INT ORBIT 000986
CHANNEL-RANGE 3200
08-08 16-16 16-21 18-18 17-17 TIME SUB POINT 10-10 12-12 14-14 03-03 15-15
1800 N29 W099
1815 N76 W142
1830 N49 E090
1845 S01 E075
1900 S50 E059
1915 S75 W071
1930 S28 W111
1945 N22 W124
2000 N70 W152
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

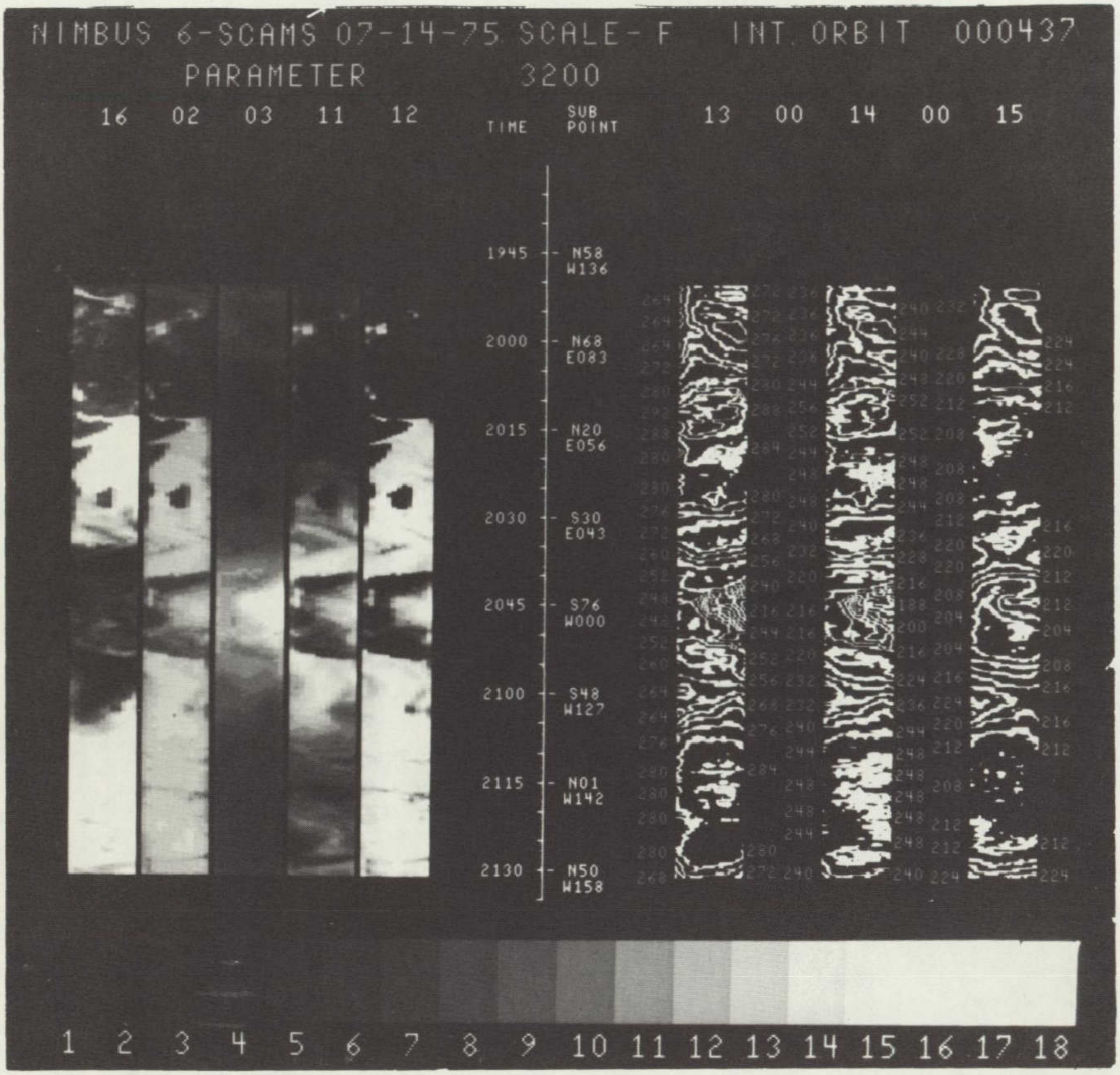


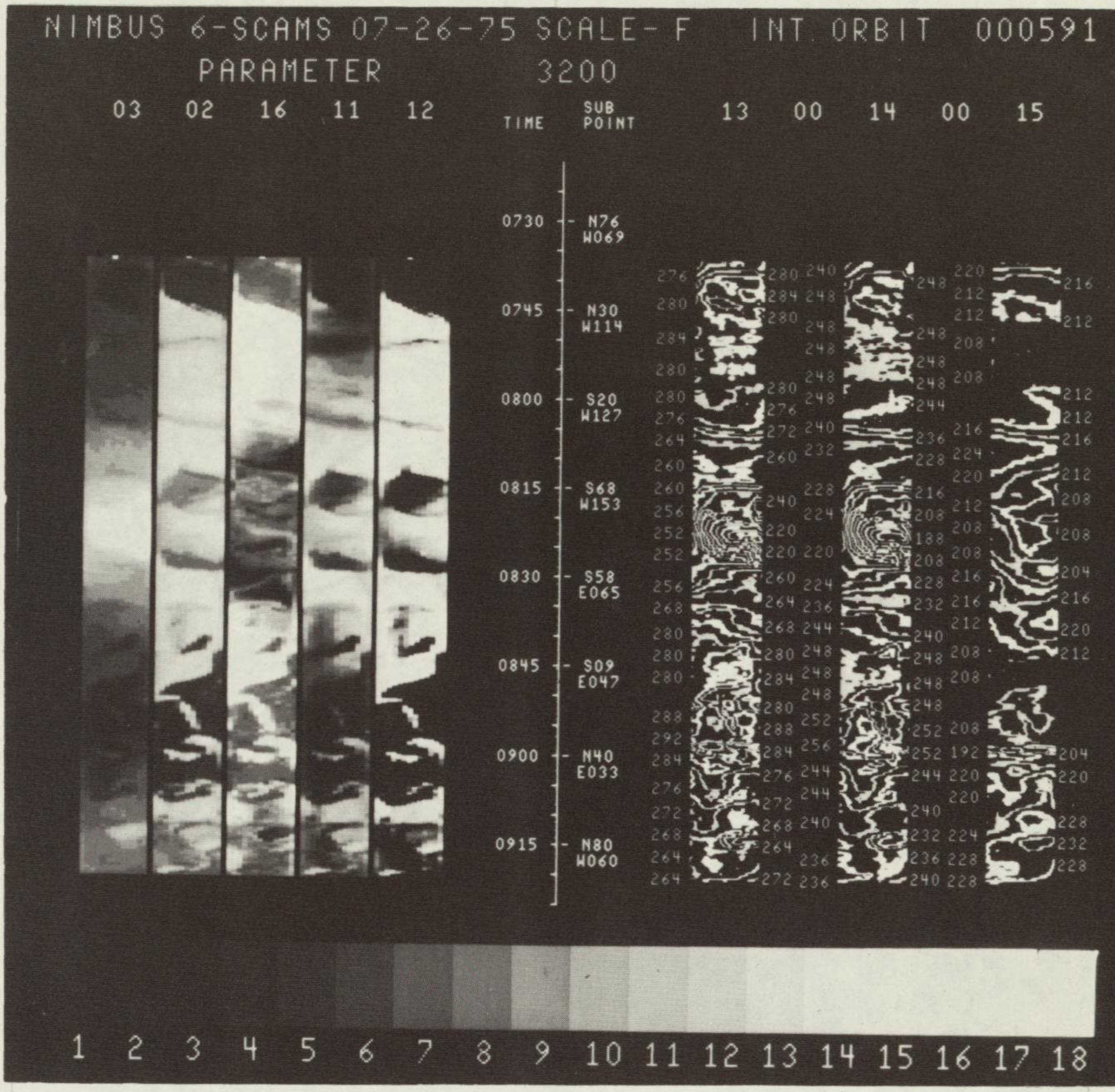
NIMBUS 6-HIRS 08-29-75 SCALE-F INT ORBIT 001050
CHANNEL-RANGE 3200
08-08 16-16 16-21 18-18 17-17
TIME
SUB POINT
10-10 12-12 14-14 03-03 15-15
1245 N69 W043
1300 N57 E177
1315 N08 E159
1330 S42 E145
1345 S80 E044
1400 S36 W026
1415 N13 W040
1430 N62 W060
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

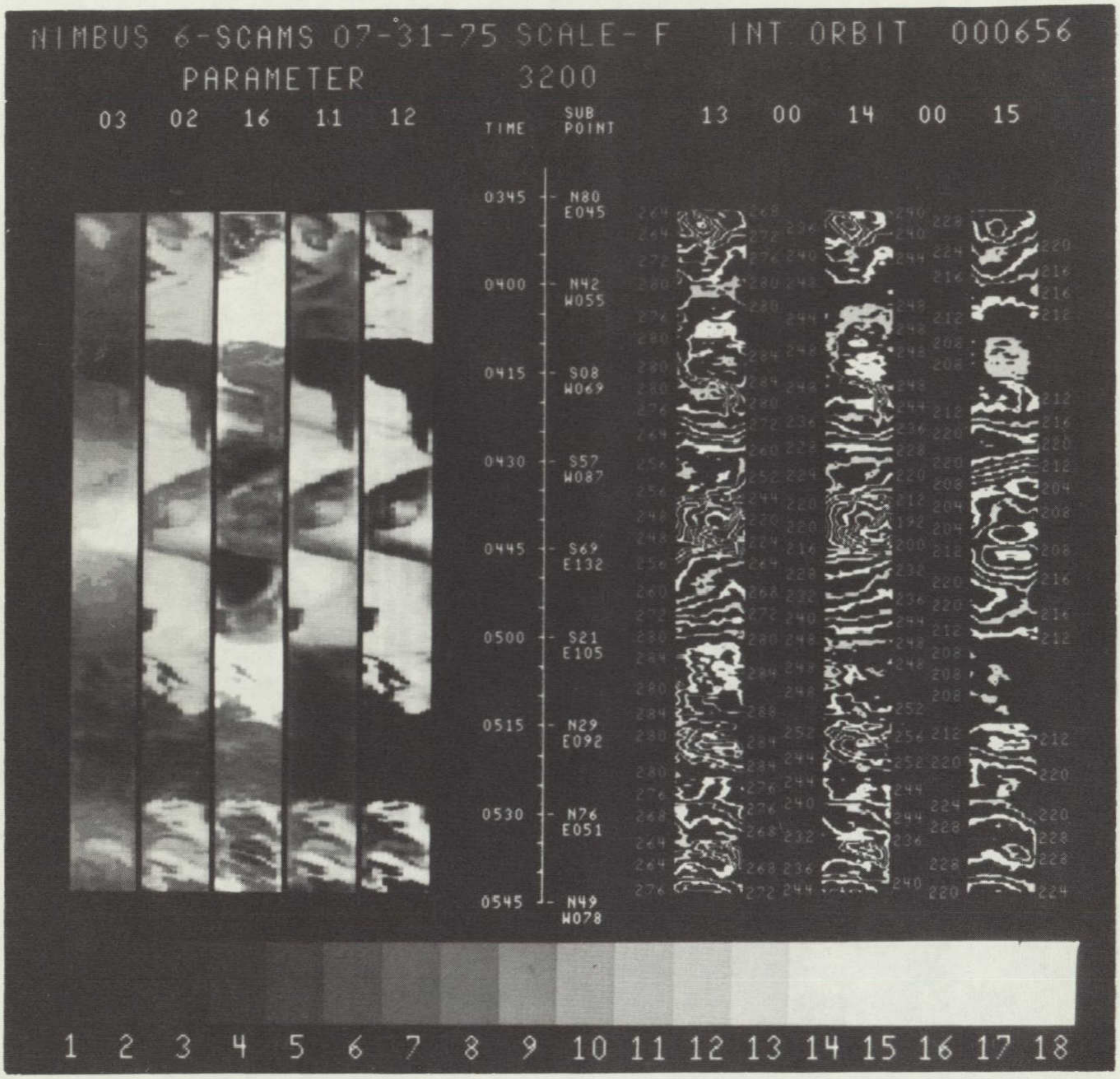
SECTION 3.2

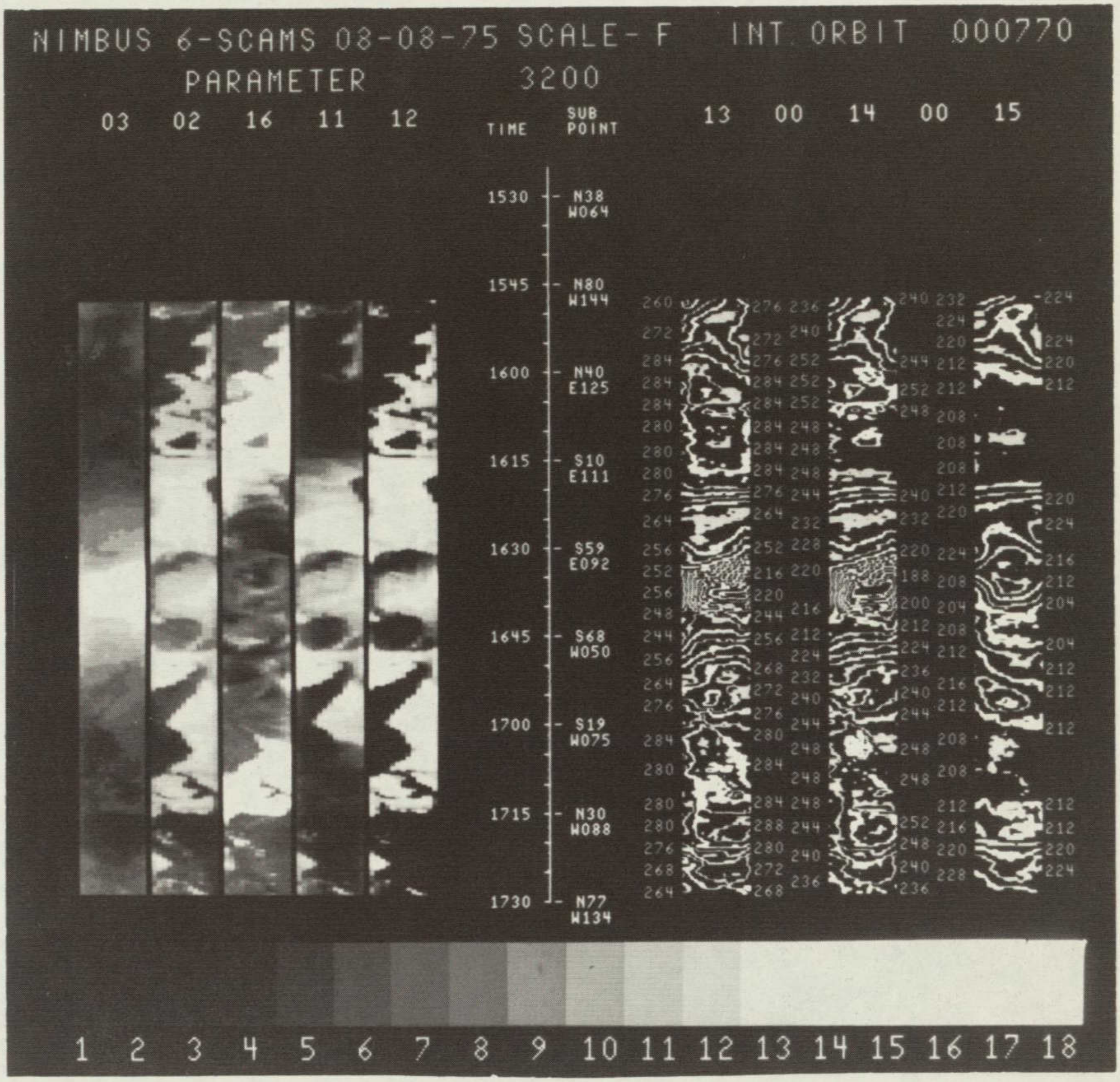
SELECTED SCAMS IMAGE DISPLAYS

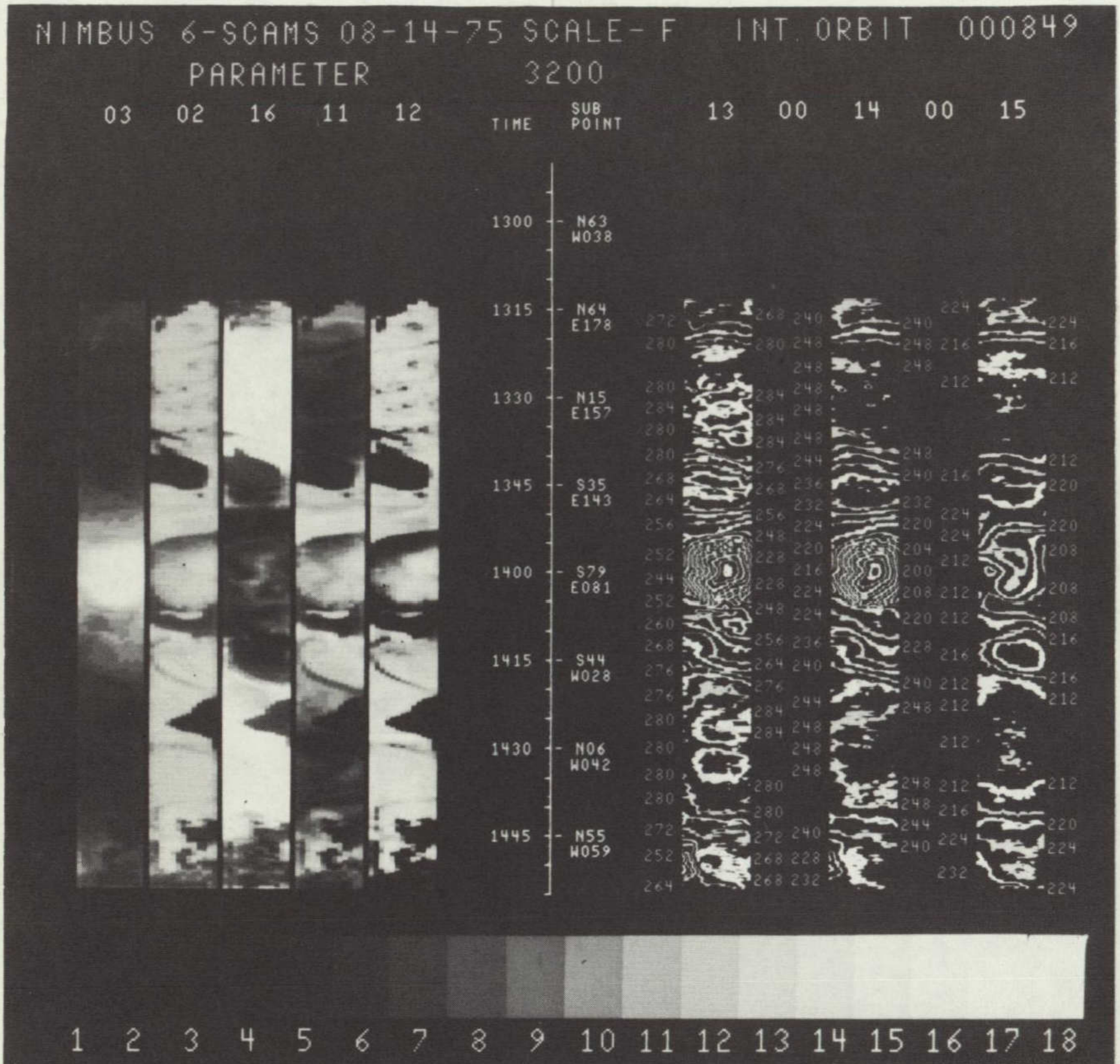
(The same orbits of HIRS and ESMR images are shown in Sections 3.1 and 3.3, respectively.)

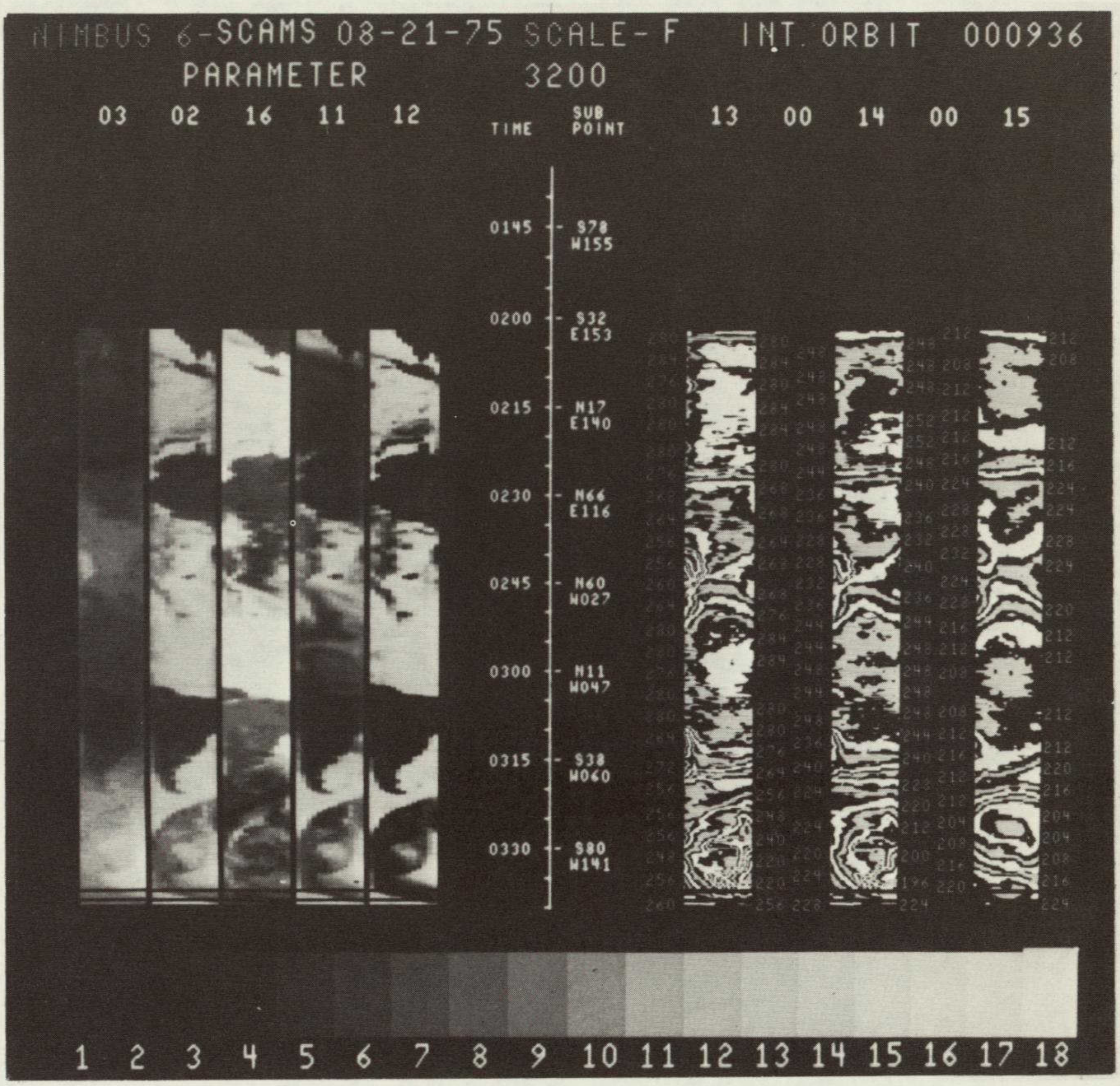

NIMBUS 6-SCAMS 07-14-75 SCALE-F INT. ORBIT 000437
PARAMETER 3200
16 02 03 11 12
TIME
SUB POINT
13 00 14 00 15
1945 N58 W136
2000 N68 E083
2015 N20 E056
2030 S30 E043
2045 S76 W000
2100 S48 W127
2115 N01 W142
2130 N50 W158
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

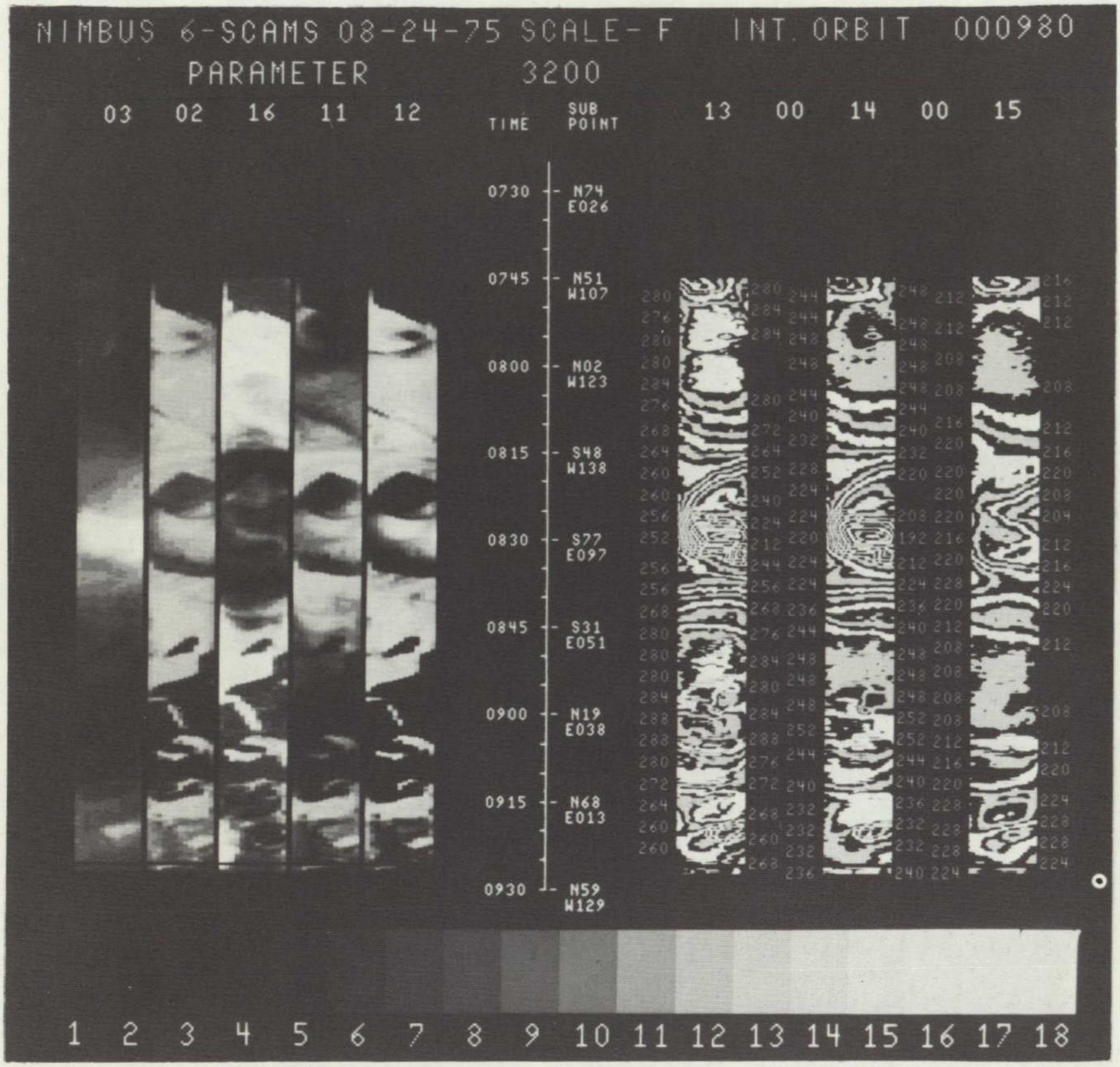

NIMBUS 6-SCAMS 07-26-75 SCALE-F INT ORBIT 000591
PARAMETER 3200
03 02 16 11 12
TIME
SUB POINT
13 00 14 00 15
0730 N76 W069
0745 N30 W114
0800 S20 W127
0815 S68 W153
0830 S58 E065
0845 S09 E047
0900 N40 E033
0915 N80 W060
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

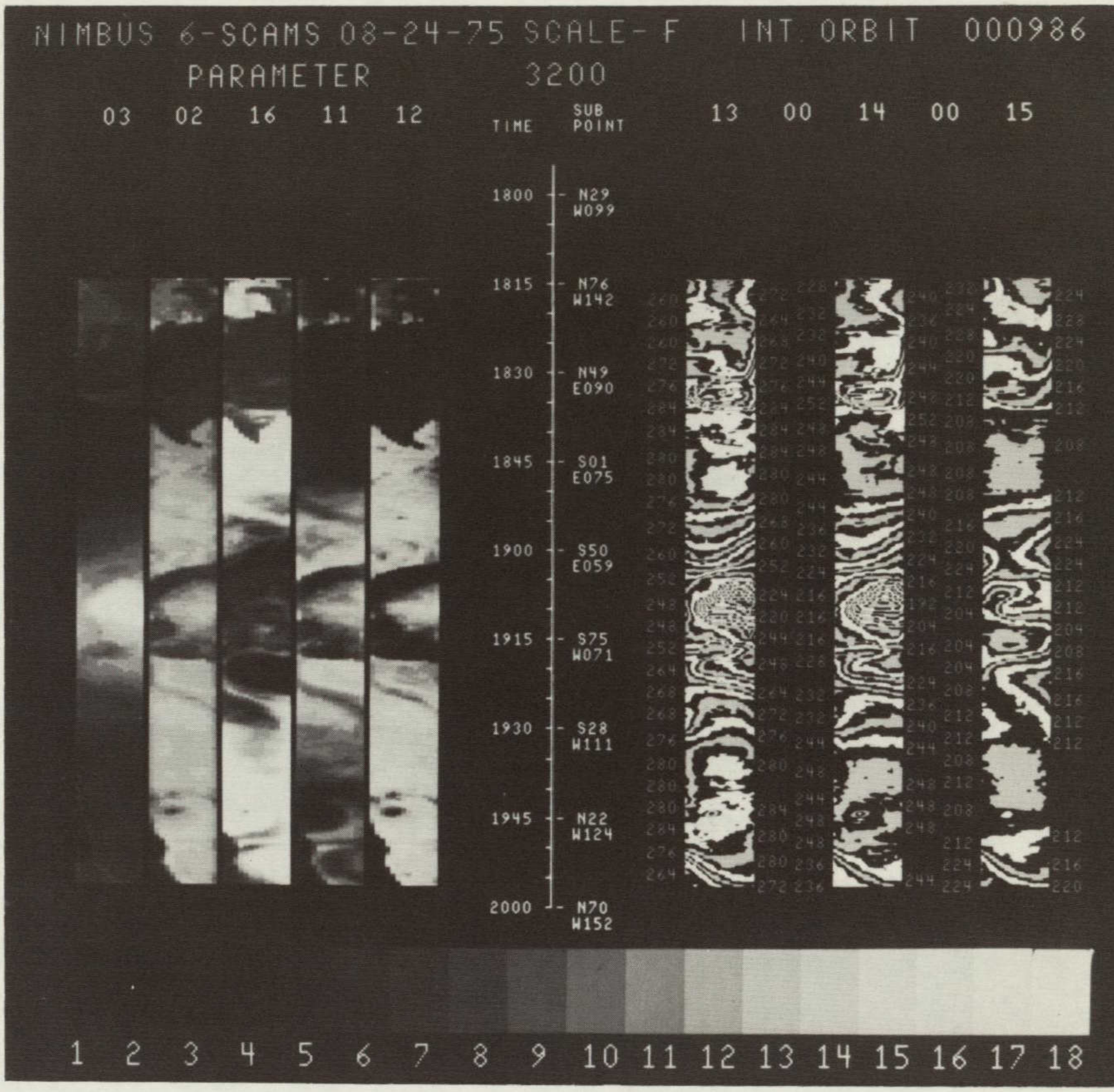

NIMBUS 6-SCAMS 07-31-75 SCALE- F INT ORBIT 000656
PARAMETER 3200
03 02 16 11 12
TIME
SUB POINT
13 00 14 00 15
0345 N80 E045
0400 N42 W055
0415 S08 W069
0430 S57 W087
0445 S69 E132
0500 S21 E105
0515 N29 E092
0530 N76 E051
0545 N49 W078
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

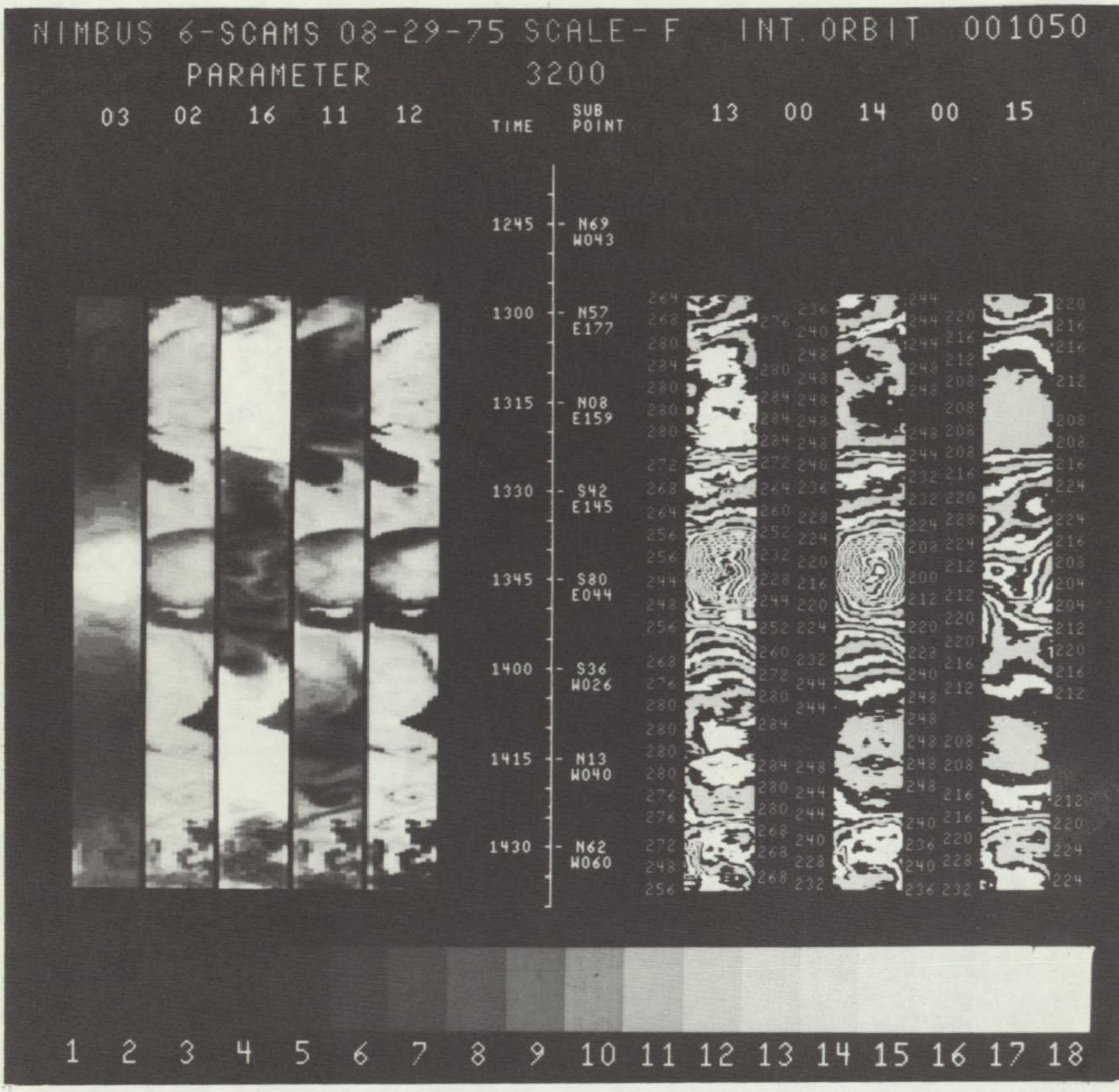

NIMBUS 6-SCAMS 08-08-75 SCALE- F INT ORBIT 000770
PARAMETER 3200
03 02 16 11 12
TIME
SUB POINT
13 00 14 00 15
1530 N38 W064
1545 N80 W144
1600 N40 E125
1615 S10 E111
1630 S59 E092
1645 S68 W050
1700 S19 W075
1715 N30 W088
1730 N77 W134
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18


NIMBUS 6-SCAMS 08-14-75 SCALE-F INT ORBIT 000849
PARAMETER 3200
03 02 16 11 12
TIME
SUB POINT
13 00 14 00 15
1300 N63 W038
1315 N64 E178
1330 N15 E157
1345 S35 E143
1400 S79 E081
1415 S44 W028
1430 N06 W042
1445 N55 W059
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18


NIMBUS 6-SCAMS 08-21-75 SCALE-F INT. ORBIT 000936
PARAMETER 3200
03 02 16 11 12
TIME
SUB POINT
13 00 14 00 15
0145 S78 W155
0200 S32 E153
0215 N17 E140
0230 N66 E116
0245 N60 W027
0300 N11 W047
0315 S38 W060
0330 S80 W141
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18


NIMBUS 6-SCAMS 08-24-75 SCALE- F INT. ORBIT 000980
PARAMETER 3200
03 02 16 11 12
TIME
SUB POINT
13 00 14 00 15
0730 N74 E026
0745 N51 W107
0800 N02 W123
0815 S48 W138
0830 S77 E097
0845 S31 E051
0900 N19 E038
0915 N68 E013
0930 N59 W129
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

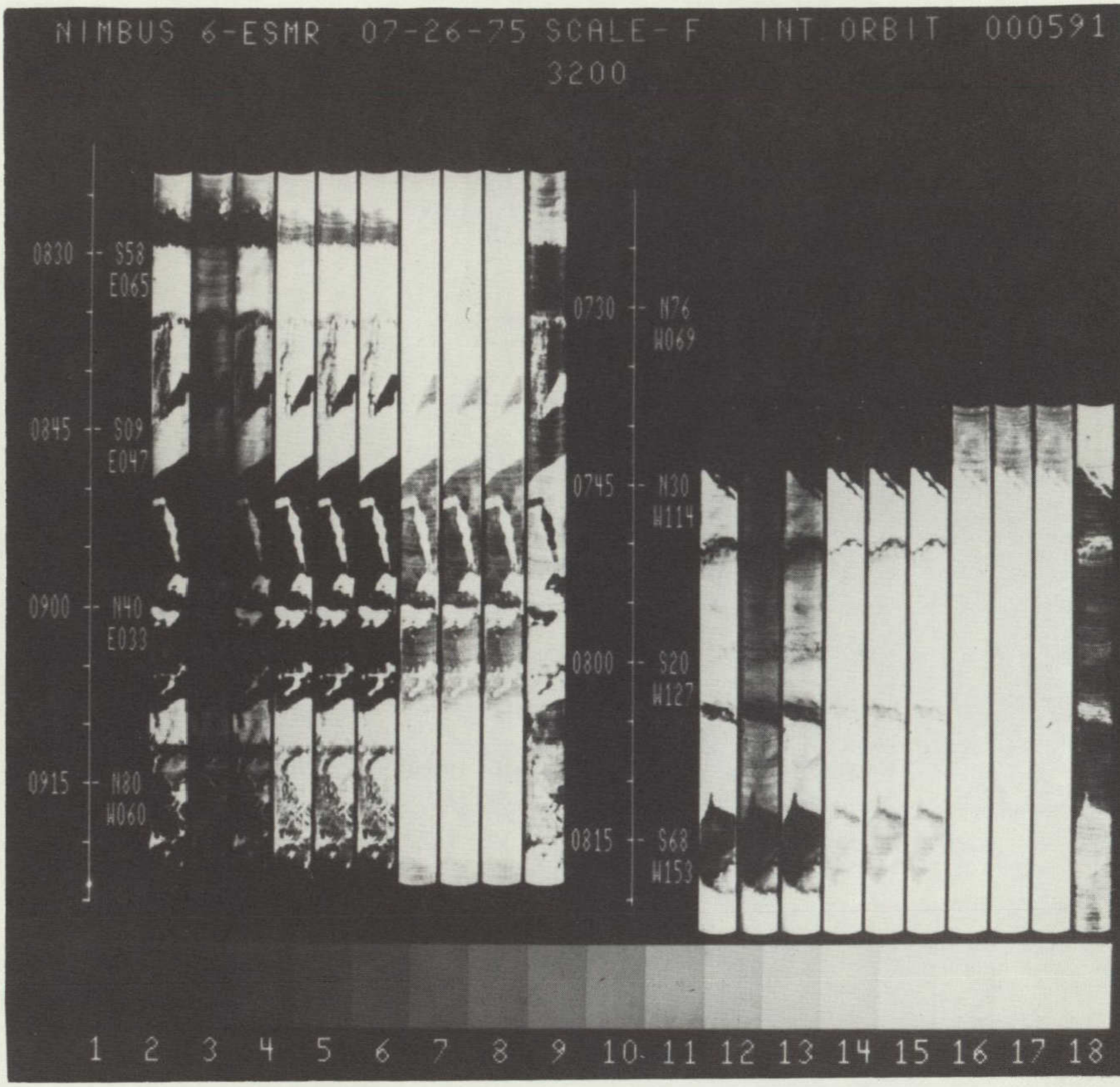

NIMBUS 6-SCAMS 08-24-75 SCALE- F INT. ORBIT 000986
PARAMETER 3200
03 02 16 11 12
TIME
SUB POINT
13 00 14 00 15
1800 N29 W099
1815 N76 W142
1830 N49 E090
1845 S01 E075
1900 S50 E059
1915 S75 W071
1930 S28 W111
1945 N22 W124
2000 N70 W152
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

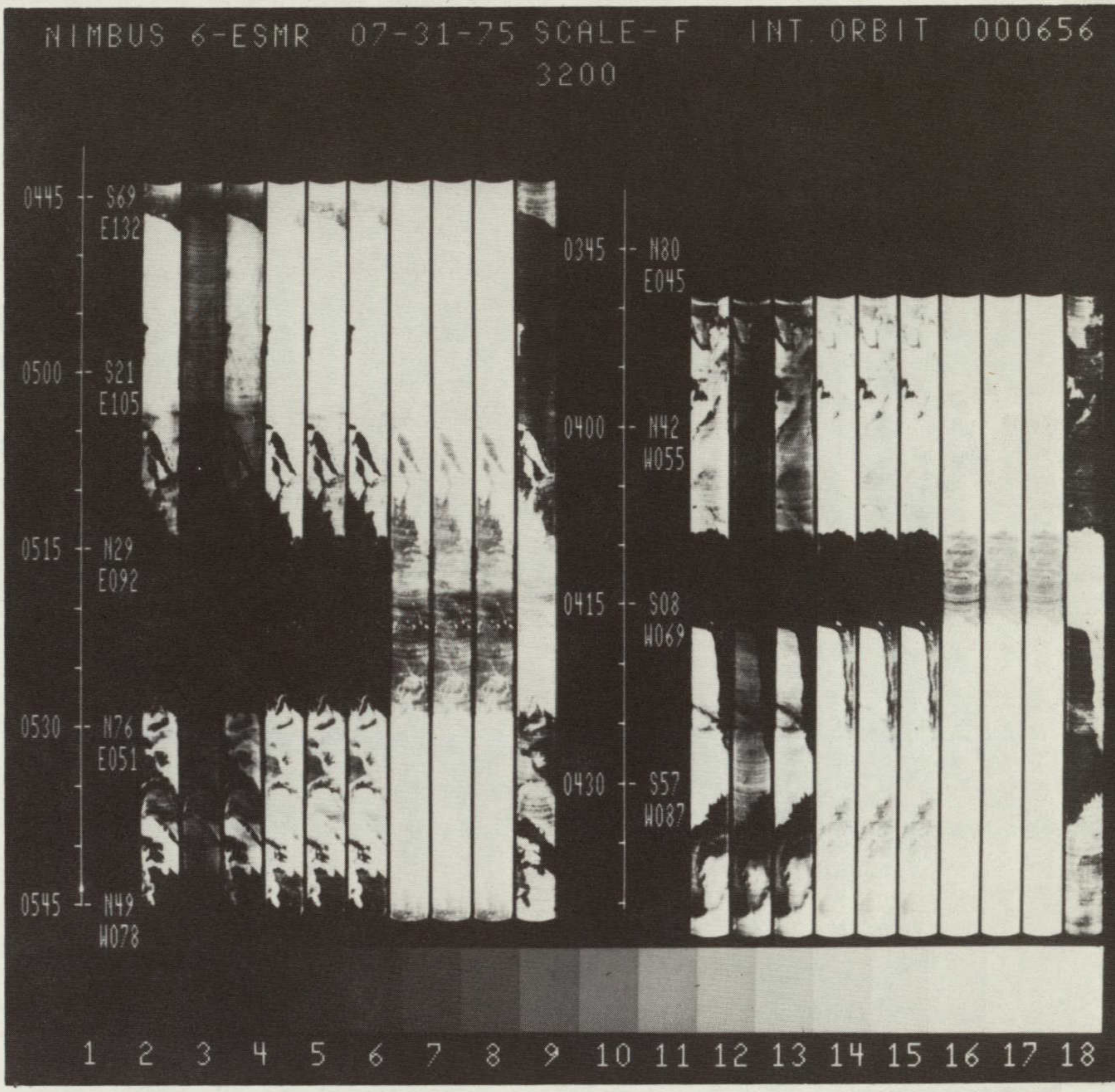

NIMBUS 6-SCAMS 08-29-75 SCALE- F INT. ORBIT 001050
PARAMETER 3200
03 02 16 11 12
TIME
SUB POINT
13 00 14 00 15
1245 N69 W043
1300 N57 E177
1315 N08 E159
1330 S42 E145
1345 S80 E044
1400 S36 W026
1415 N13 W040
1430 N62 W060
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

SECTION 3.3

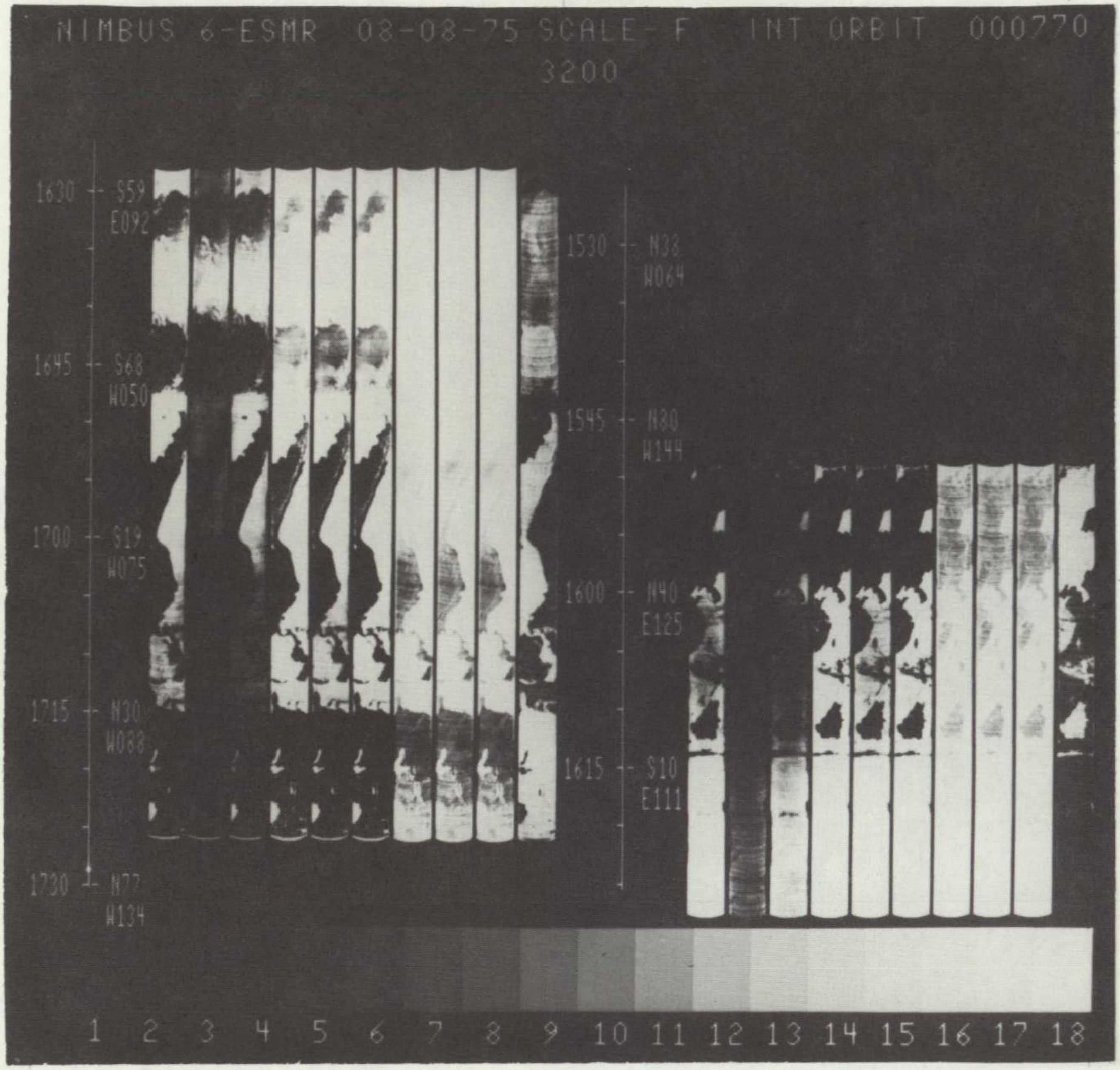
SELECTED ESMR IMAGE DISPLAYS

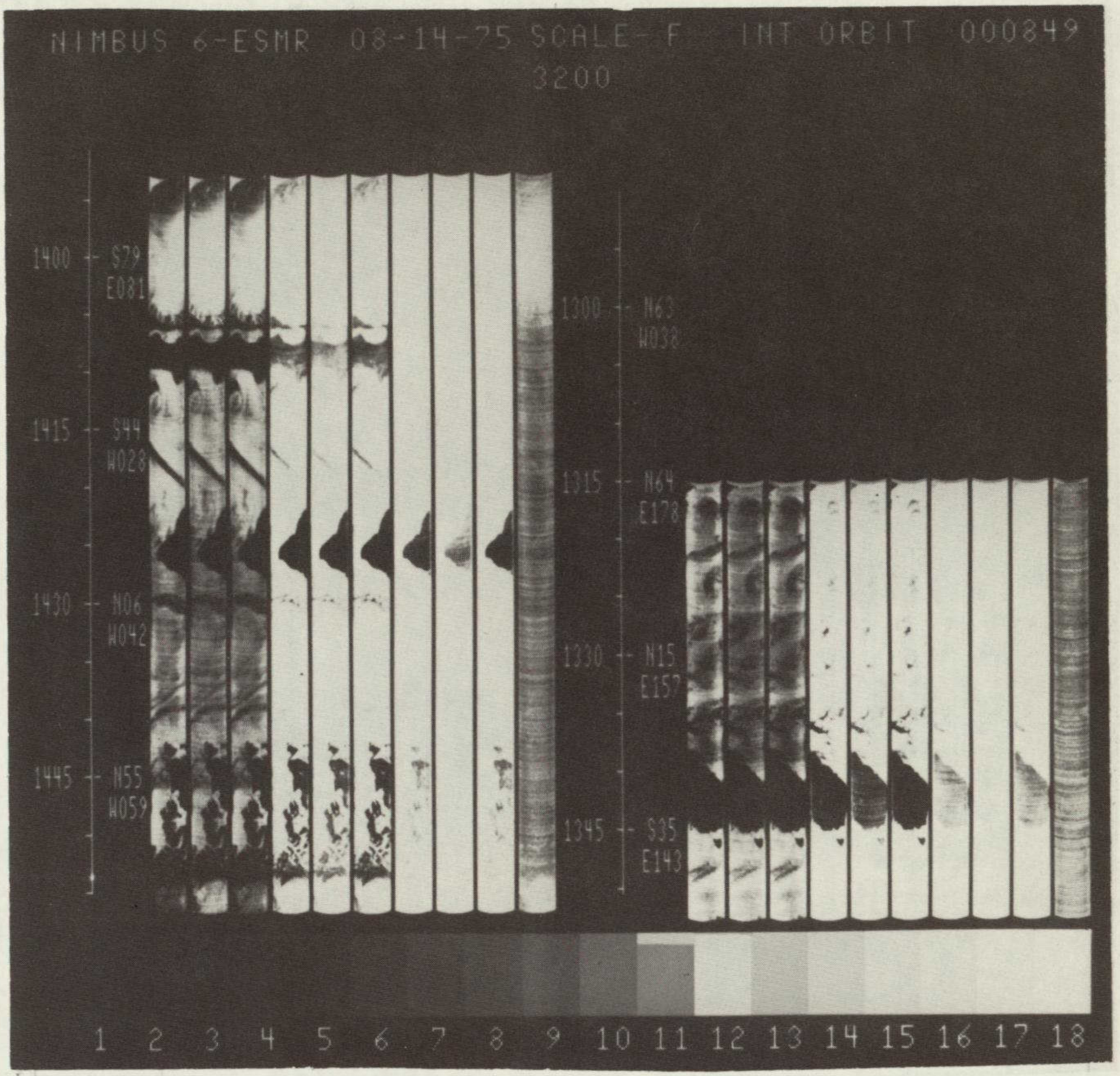
(The same orbits of HIRS and SCAMS images are shown in Sections 3.1 and 3.2, respectively.)

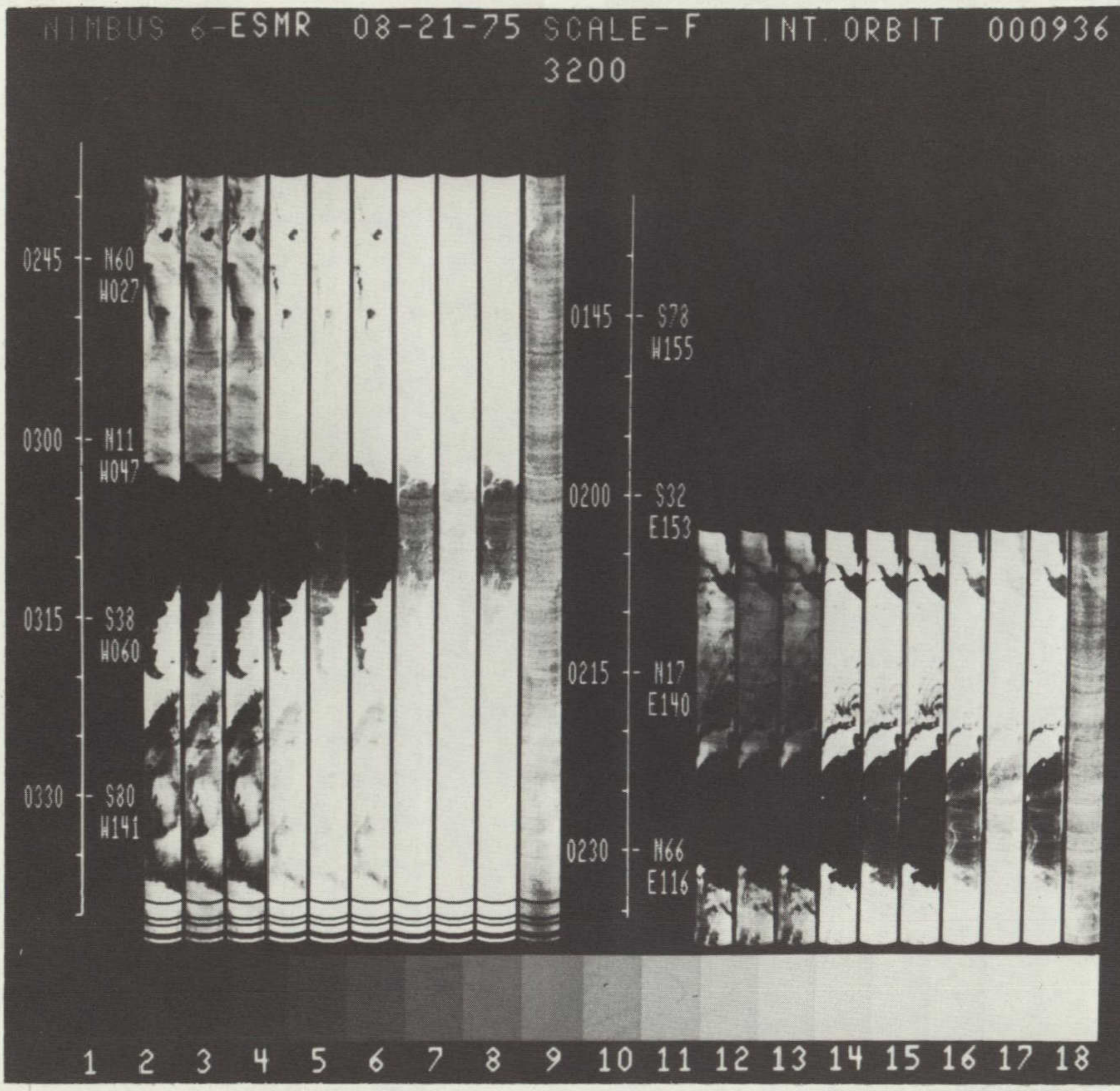

NIMBUS 6-ESMR 07-26-75 SCALE-F INT ORBIT 000591
3200
0830
S58
E065
0845
S09
E047
0900
N40
E033
0915
N80
W060
0730
N76
W069
0745
N30
W114
0800
S20
W127
0815
S68
W153
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



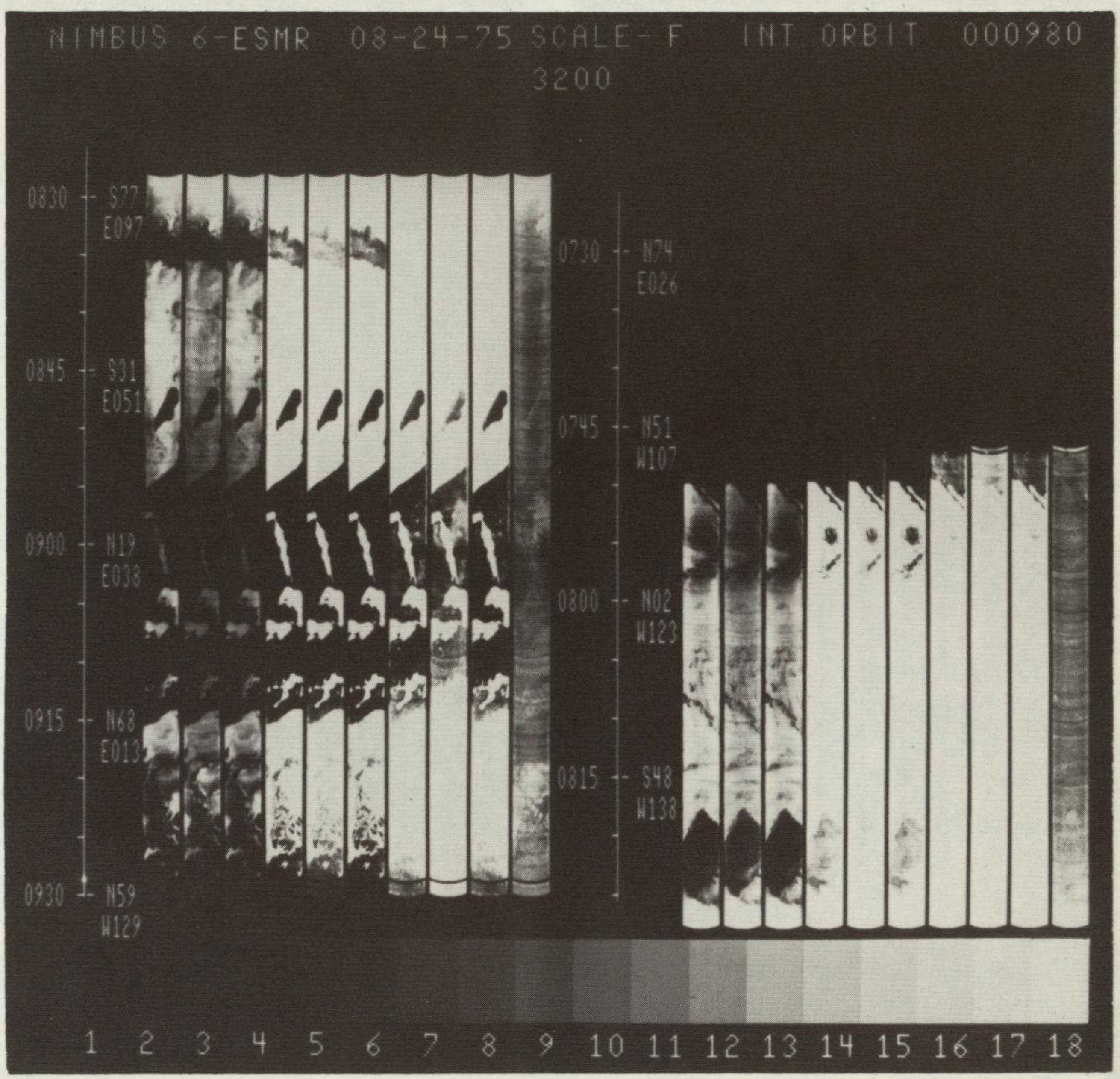
NIMBUS 6-ESMR 07-31-75 SCALE- F INT. ORBIT 000656
3200
0445
S69
E132
0500
S21
E105
0515
N29
E092
0530
N76
E051
0545
N49
W078
0345
N80
E045
0400
N42
W055
0415
S08
W069
0430
S57
W087
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

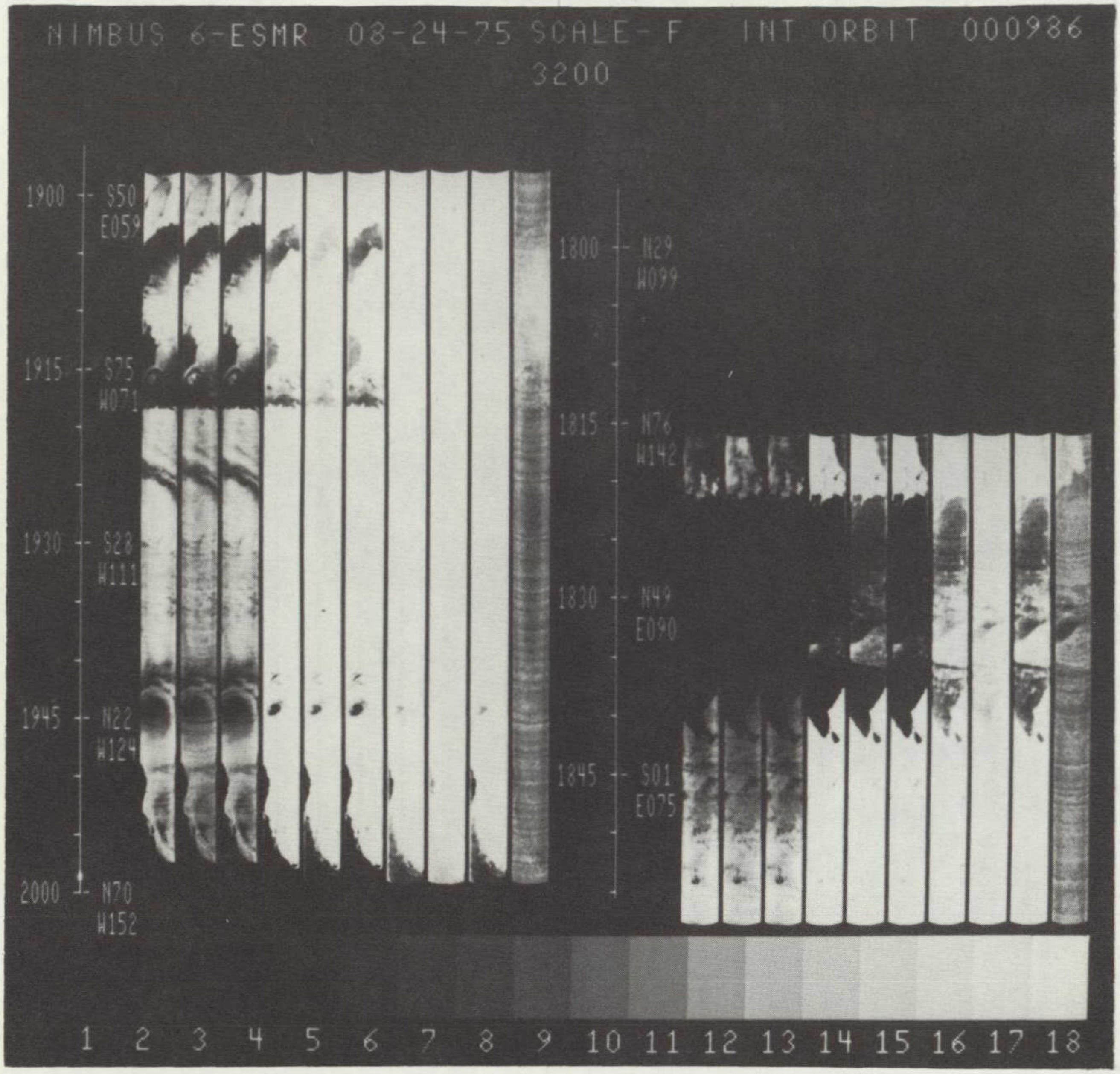

NIMBUS 6-ESMR 08-08-75 SCALE-F INT ORBIT 000770
3200
1630 S59 E092
1645 S68 W050
1700 S19 W075
1715 N30 W088
1730 N77 W134
1530 N38 W064
1545 N80 W144
1600 N40 E125
1615 S10 E111
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18


NIMBUS 6-ESMR 08-14-75 SCALE- F INT ORBIT 000849
3200
1400
S79
E081
1415
S44
W028
1430
N06
W042
1445
N55
W059
1300
N63
W038
1315
N64
E178
1330
N15
E157
1345
S35
E143
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



NIMBUS 6-ESMR 08-21-75 SCALE-F INT. ORBIT 000936
3200
0245 N60 W027
0300 N11 W047
0315 S38 W060
0330 S80 W141
0145 S78 W155
0200 S32 E153
0215 N17 E140
0230 N66 E116
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18


NIMBUS 6-ESMR 08-24-75 SCALE-F INT ORBIT 000980
3200
0830 S77 E097
0845 S31 E051
0900 N19 E038
0915 N68 E013
0930 N59 W129
0730 N74 E026
0745 N51 W107
0800 N02 W123
0815 S48 W138
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18


NIMBUS 6-ESMR 08-24-75 SCALE-F INT ORBIT 000986
3200
1900
S50
E059
1915
S75
W071
1930
S28
W111
1945
N22
W124
2000
N70
W152
1800
N29
W099
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W142
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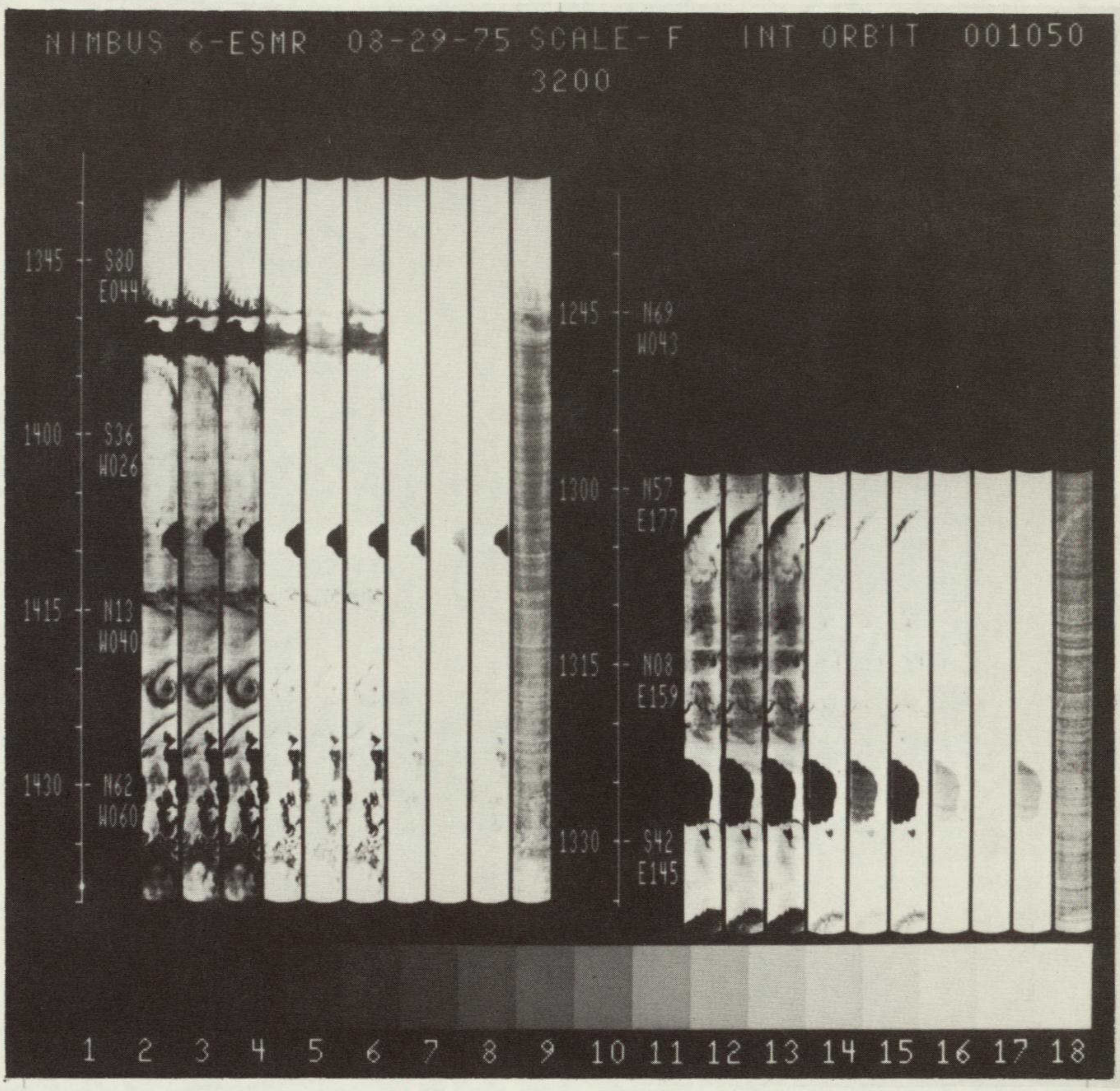
E090
1845
S01
E075
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18


NIMBUS 6-ESMR 08-29-75 SCALE- F INT ORBIT 001050
3200
1345 S80 E044
1400 S36 W026
1415 N13 W040
1430 N62 W060
1245 N69 W043
1300 N57 E177
1315 N08 E159
1330 S42 E145
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

SECTION 4

TEMPERATURE HUMIDITY INFRARED RADIOMETER MONTAGES

The Nimbus 6 Temperature Humidity Infrared Radiometer (THIR) subsystem is of the same design and operation as the THIR flown on Nimbus 4 and 5. The two-channel scanning radiometer measures earth radiation in two spectral bands. A 10.3 μm to 12.5 μm (11.5 μm) window channel provides an image of the cloud cover, and temperatur of the cloud tops, land, and ocean surfaces. A 6.5 μm to 7.1 μm (6.7 μm) channel provides information on the moisture content of the upper troposphere and stratosphere, and the location of jet streams and frontal systems. Ground resolution at the satellite subpoint is 8.2 km for the 11.5 μm channel and 22.5 km for the 6.7 μm channel. Both channels operate continuously to provide day and night global coverage. However, with only HDRSS recorder (A) available for full-time use on the satellite, gaps in global coverage occur over "blind" orbit areas, and sometimes over the Rosman and Alaska STDN stations, when the tape data are being transmitted to the ground. The blind orbits occur during a daytime pass over the western part of the Pacific Ocean and during a nighttime pass over the eastern part of the Atlantic Ocean. These blind orbit areas happen when the Orroral, Australia is not available for playback of recorded data. Then the time between successive playbacks of the tape recorder becomes longer than the record capability of the good HDRSS A plus the reduced capability of HDRSS B.

This section pictorially documents the data from the THIR. Section 4.1 contains all nighttime THIR 11.5 μm and 6.7 μm montages and Section 4.2 contains all daytime THIR 11.5 μm and 6.7 μm montages, arranged in chronological order. Key latitudes can be read from the superimposed grids. Grid points are identified where each swath crosses 60°N, 30°N, EQUATOR, 30°S and 60°S.

Vellum Location Guide overlays, attached to the back of this document, are to be used for general orientation with the data presented in each THIR montage. Proper alignment of the overlay grid is accomplished by matching the grid indices on the equator with the two "T" marks on each montage.

THIR photographic data and/or digital data can be ordered through the National Space Science Data Center (NSSDC), Code 601, Goddard Space Flight Center, Greenbelt, Maryland 20771.

THIR photographic data consist of 70 mm film strips produced from the radiometer output signals. The gray shades in each image correspond to temperature variations of the land, sea, and clouds. On a film positive the lightest tones represent cold temperatures, while the darkest tones represent warm temperatures. THIR photographic data are archived in separate 6.7 μm and 11.5 μm daytime and nighttime swaths. The approximate coverage of a full swath is from pole to pole.

When ordering THIR photographic data from NSSDC the following information should be given:

- Satellite (e.g. Nimbus 6)
- Date of data
- Data orbit number, channel (11.5 μm or 6.7 μm), and whether day or night data
- Data format, i.e., positive or negative transparencies, or prints
- Area of interest defined by latitude and longitude

In addition to the THIR film strips, photographic copies of the daily day or night montages prepared from film strips can be obtained.

Quantitative digital data are obtained when the original analog signals are digitized with full fidelity, and processed by an IBM 360 computer, where calibration and geographic referencing are applied. Each reduced radiation data tape prepared by the IBM 360 is called a Nimbus Meteorological Radiation Tape-THIR (NMRT-THIR). The NMRT can be used to generate grid print maps or to accomplish special scientific analyses. The format of this tape may be found in The Nimbus 6 User's Guide, Section 2.

Due to the large volume and the long computer running time required for processing THIR into NMRTs, Nimbus 6 THIR digital data are not routinely reduced to final NMRT format. Only those data which are specifically requested by the user will be processed. Requests should be made through NSSDC. It is anticipated that requested NMRT-THIR will begin to be available through NSSDC six months after launch. The user is urged to make full use of the film strips which are abundantly available in nearly real time from the NSSDC.

A series of programs at GSFC produce printed and contoured data referenced to a grid on Polar Stereographic or Mercator map bases. These are called grid print maps. The advantages of the grid print map presentation are the display of absolute values of temperatures in their approximate location and geographical rectification of the data. Grid print maps may be produced for either a single orbit or a composite of several orbits. The following standard options are available and should be specified when requesting grid print maps from NSSDC.

- Map and Approximate Scale

  a. Polar Stereographic, 1:30 million

  b. Polar Stereographic, 1:10 million

c. Multi-resolution Mercator maps are available down to 1:1 million scale.

- Maximum Scan Angle (50 degrees is practical limit)

- Field Values and Contouring. Unless otherwise specified, all maps will include field values and contouring except Mercator maps of scales larger than 1:20 million. A data population map, indicating the number of individual measurements contained in each grid point average, as well as a latitude-longitude description for geographically locating the data, will be provided along with each grid print map.

When ordering grid print map data, the following identifying information should be given:

- Satellite (e.g., Nimbus 6)

- Sensor (THIR)

- Channel (6.7 μm or 11.7 μm)

- Data Orbit Number

- Calendar Date of Equator Crossing

- Beginning and Ending Times of Data in GMT

- Latitude and Longitude Limits of Area of Interest

- Map Type and Map Scale

- Scan Angle Limits

- Contouring or No Contouring of Data Points

When ordering NMRTs, the "Calendar Date of Equator Crossing" and "Map type and Map Scale" can be omitted.

Beginning and ending times of data in GMT can be interpolated using Table 4-1 which gives the elapsed time from either ascending or descending node as a function of latitude. These elapsed time values can be appropriately added or subtracted from node times given in Table 2-2.

A complete description of the THIR experiment may be found in The Nimbus 6 User's Guide, Section 2.

Table 4-1

Latitude Versus Minutes From
Ascending or Descending Node

Latitude from AN or DN	Minutes and Seconds from AN or DN	
0	0:00	
5	1:31	
10	3:02	
15	4:33	
20	6:03	= 1 units
25	7:34	
30	9:05	
35	10:36	
40	12:08	2 -
45	13:40	
50	15:12	
55	16:44	
60	18:18	= 3.
65	19:52	
70	21:33	
75	23:26	
78	24:44	
80.1	26:49	— 4.43
78	29:00	
75	30:09	
70	31:51	
65	33:35 LD —	5.86

SECTION 4.1

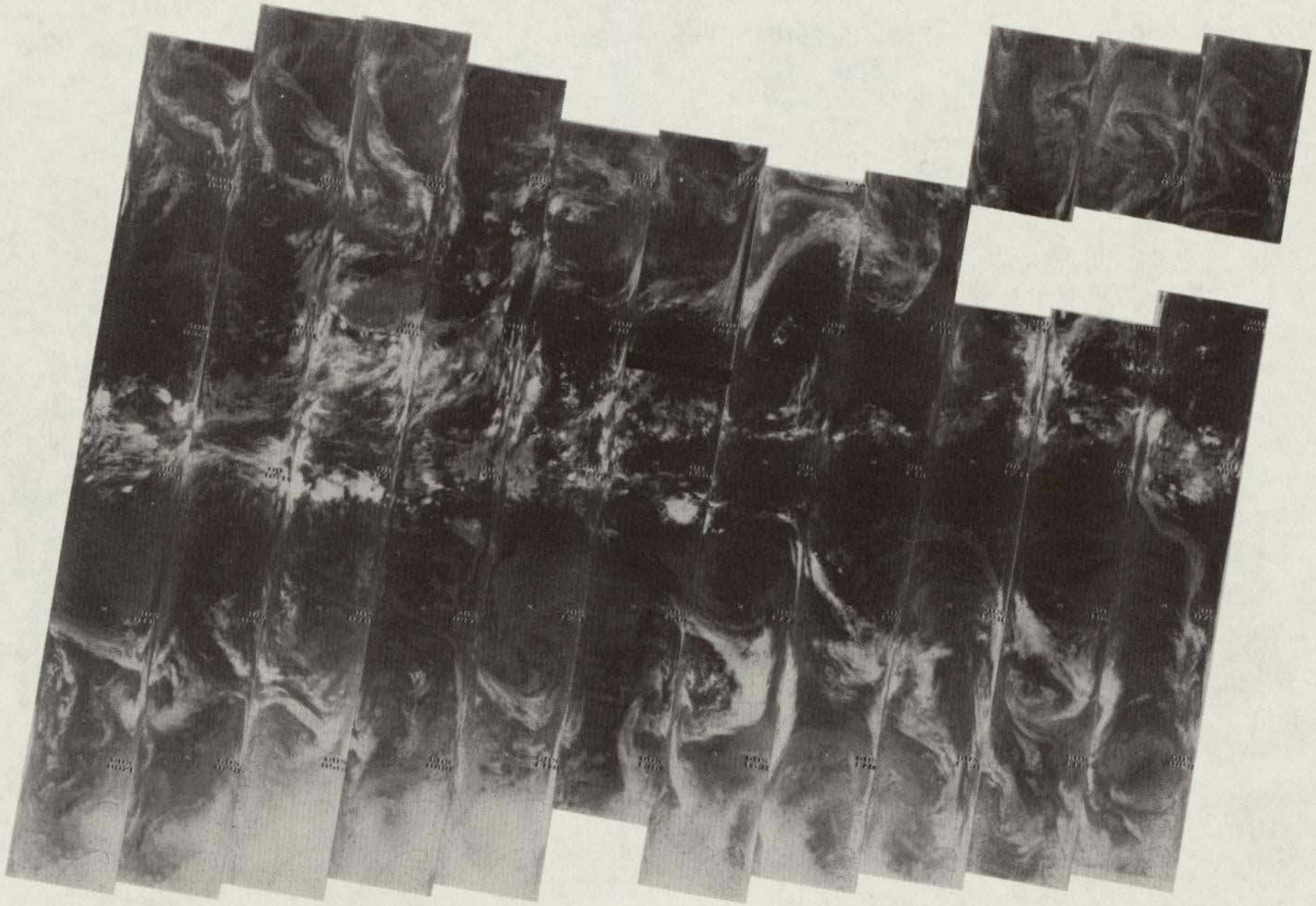
TEMPERATURE HUMIDITY INFRARED RADIOMETER NIGHTTIME MONTAGES

C-2

438 437 436 435 434 433 432 431 430 429 428 427 426

14 JULY 1975

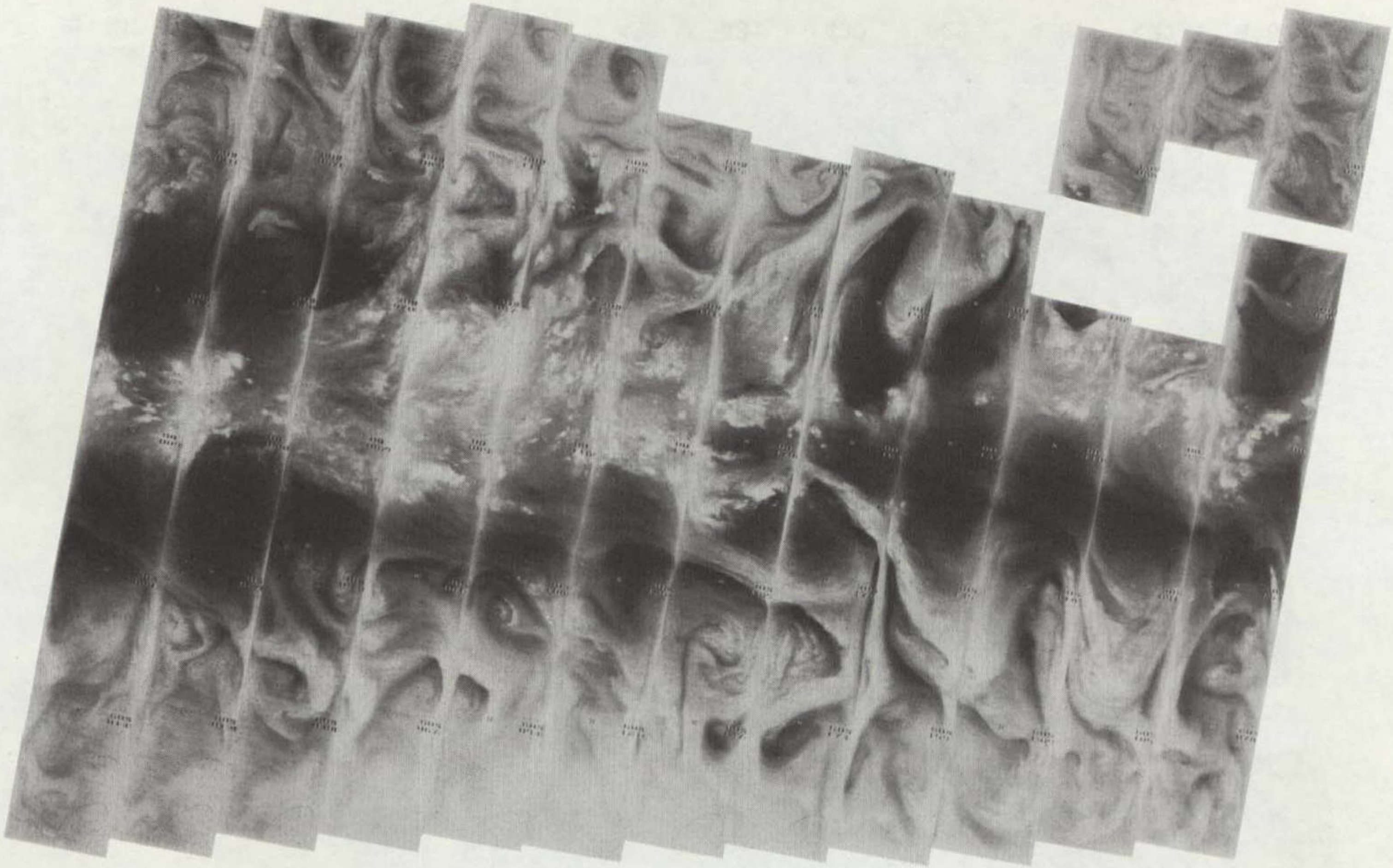
6.7 μm



438 437 436 435 434 433 432 431 430 429 428 427 426

14 JULY 1975

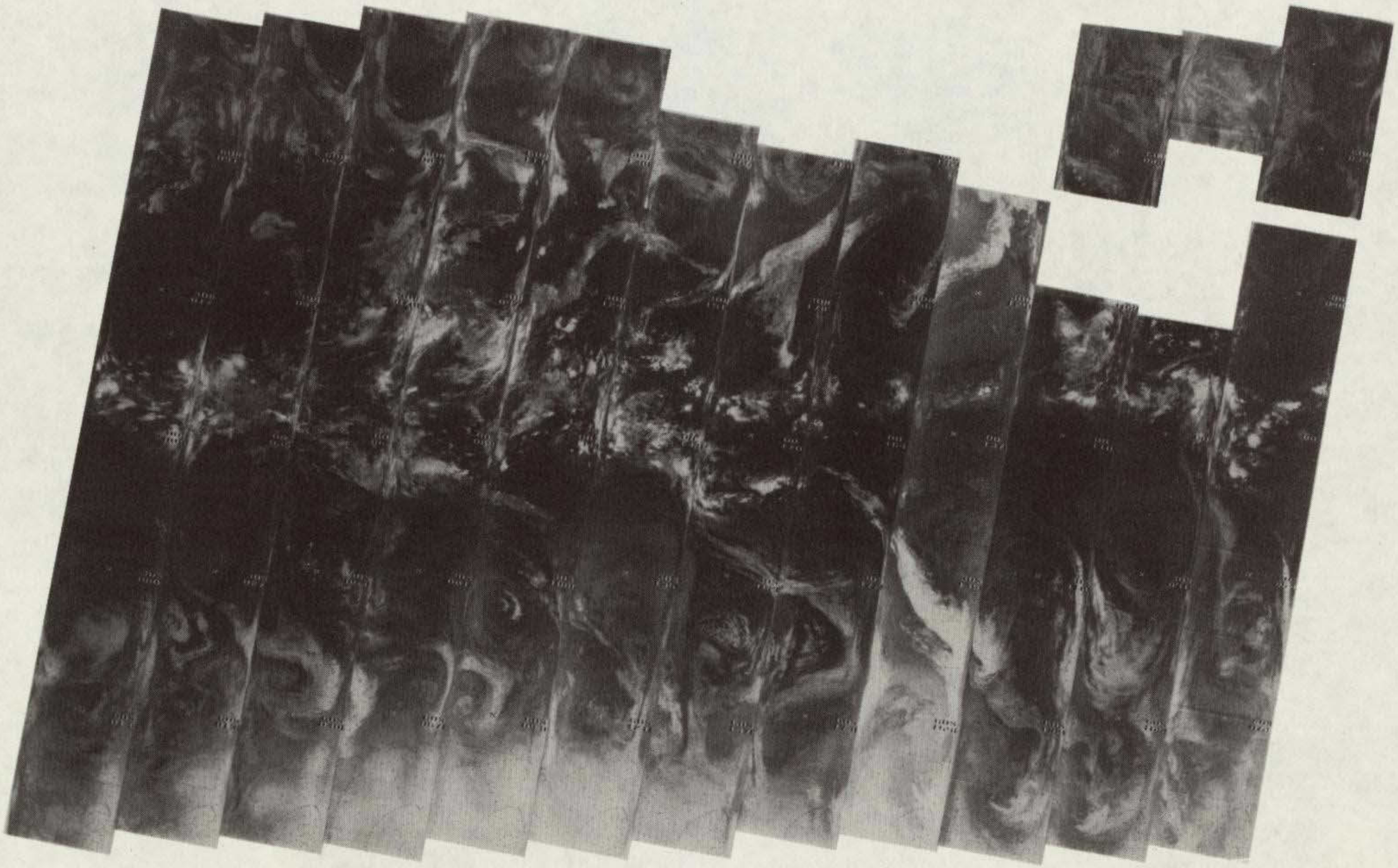
11.5 μm



451 450 449 448 447 446 445 444 443 442 441 440 439

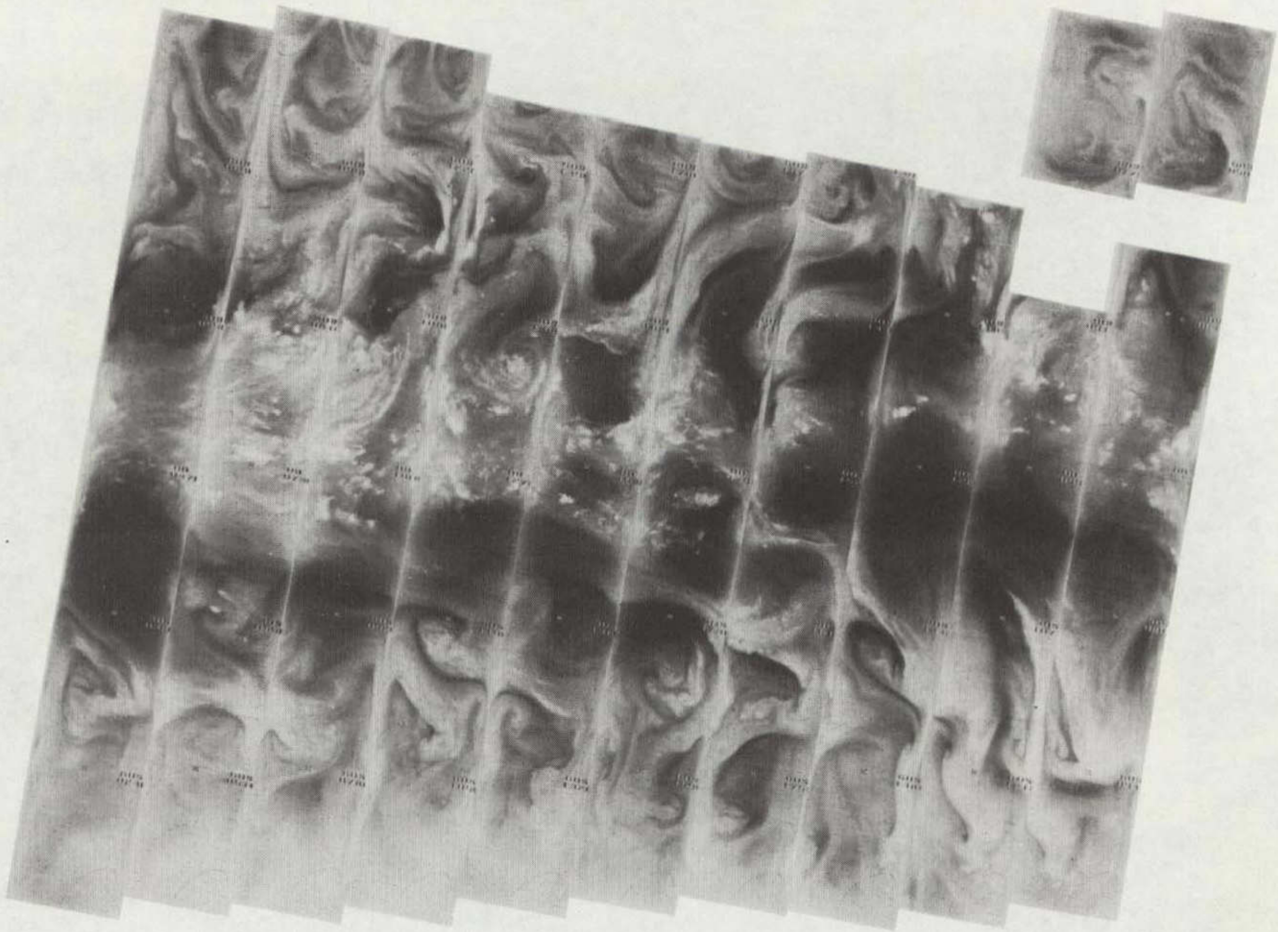
15 JULY 1975

6.7 μm



15 JULY 1975

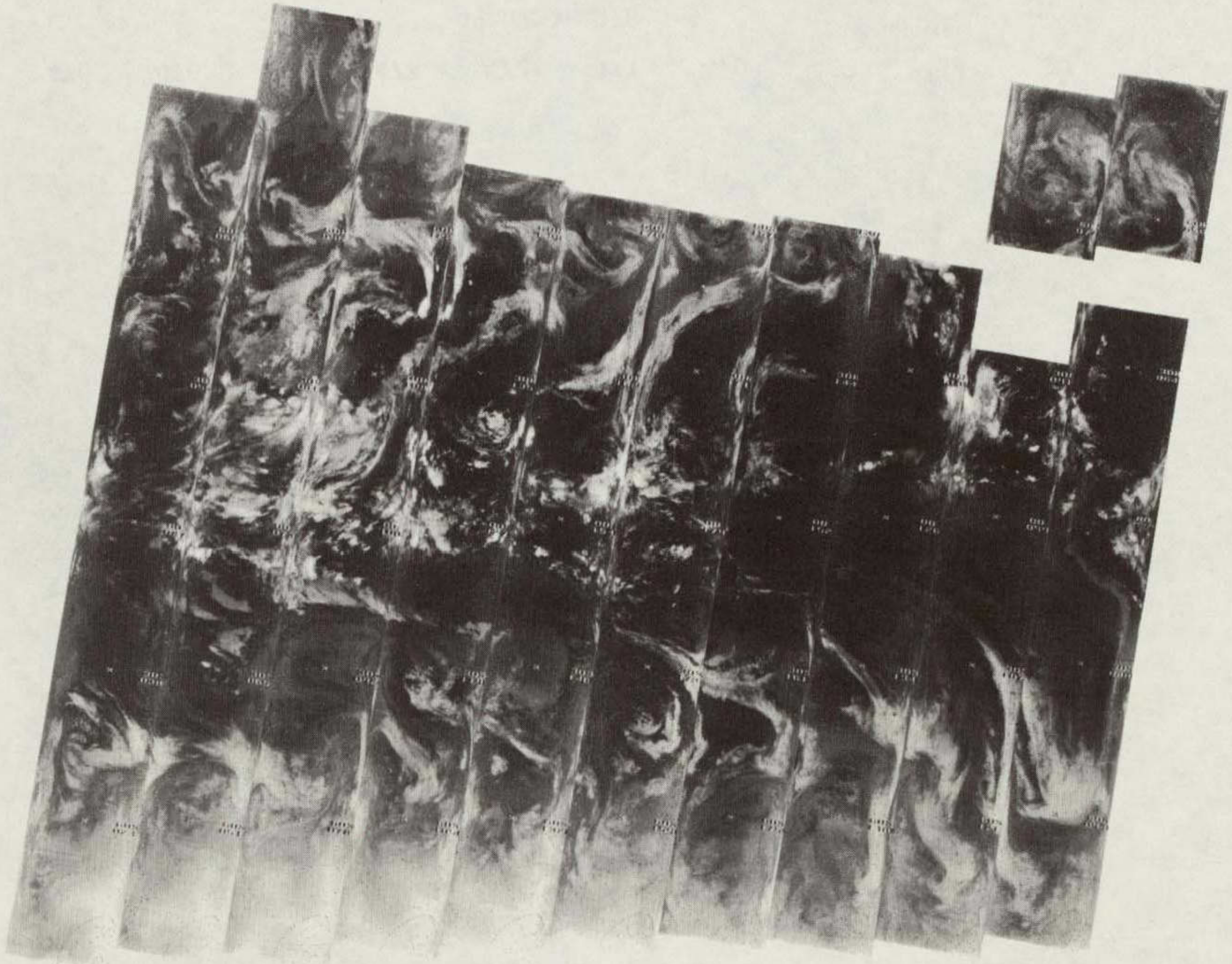
11.5 μm



465 464 463 462 461 460 459 458 457 456 455 454 453 452

16 JULY 1975

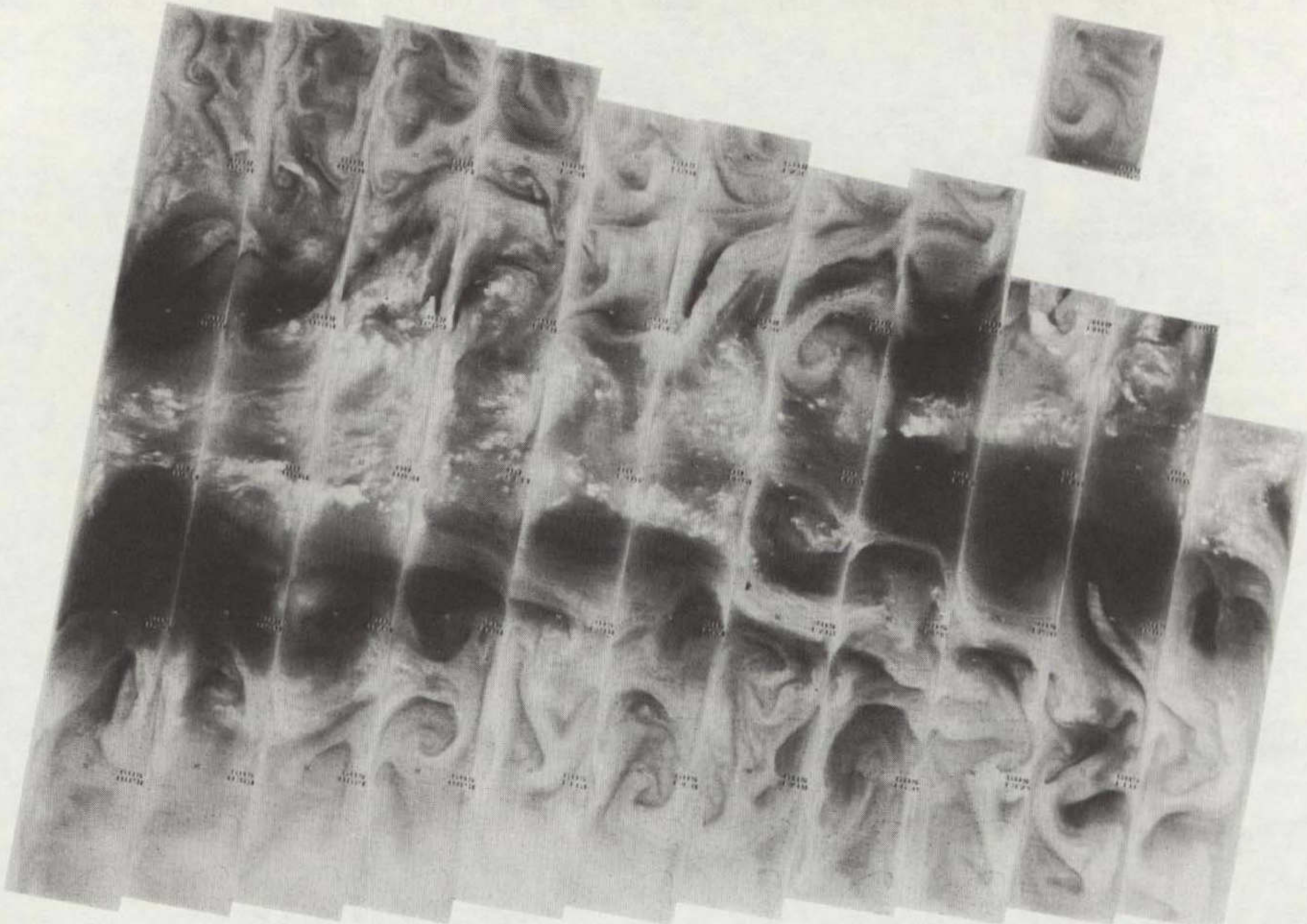
6.7 μm



465 464 463 462 461 460 459 458 457 456 455 454 453 452

16 JULY 1975

11.5 μm



478 477 476 475 474 473 472 471 470 469 468 467 466

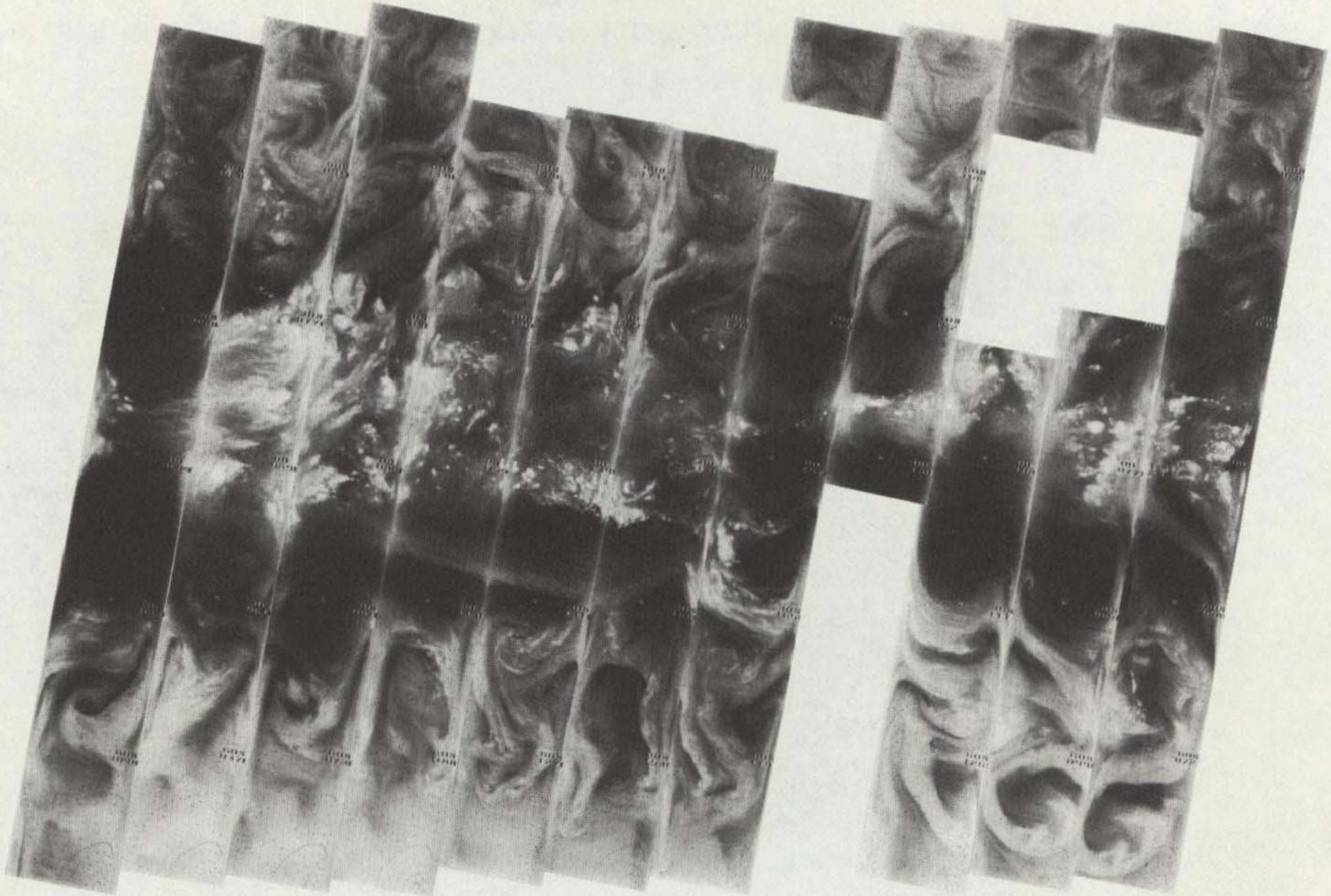
17 JULY 1975

6.7 μm

478 477 476 475 474 473 472 471 470 469 468 467 466

17 JULY 1975

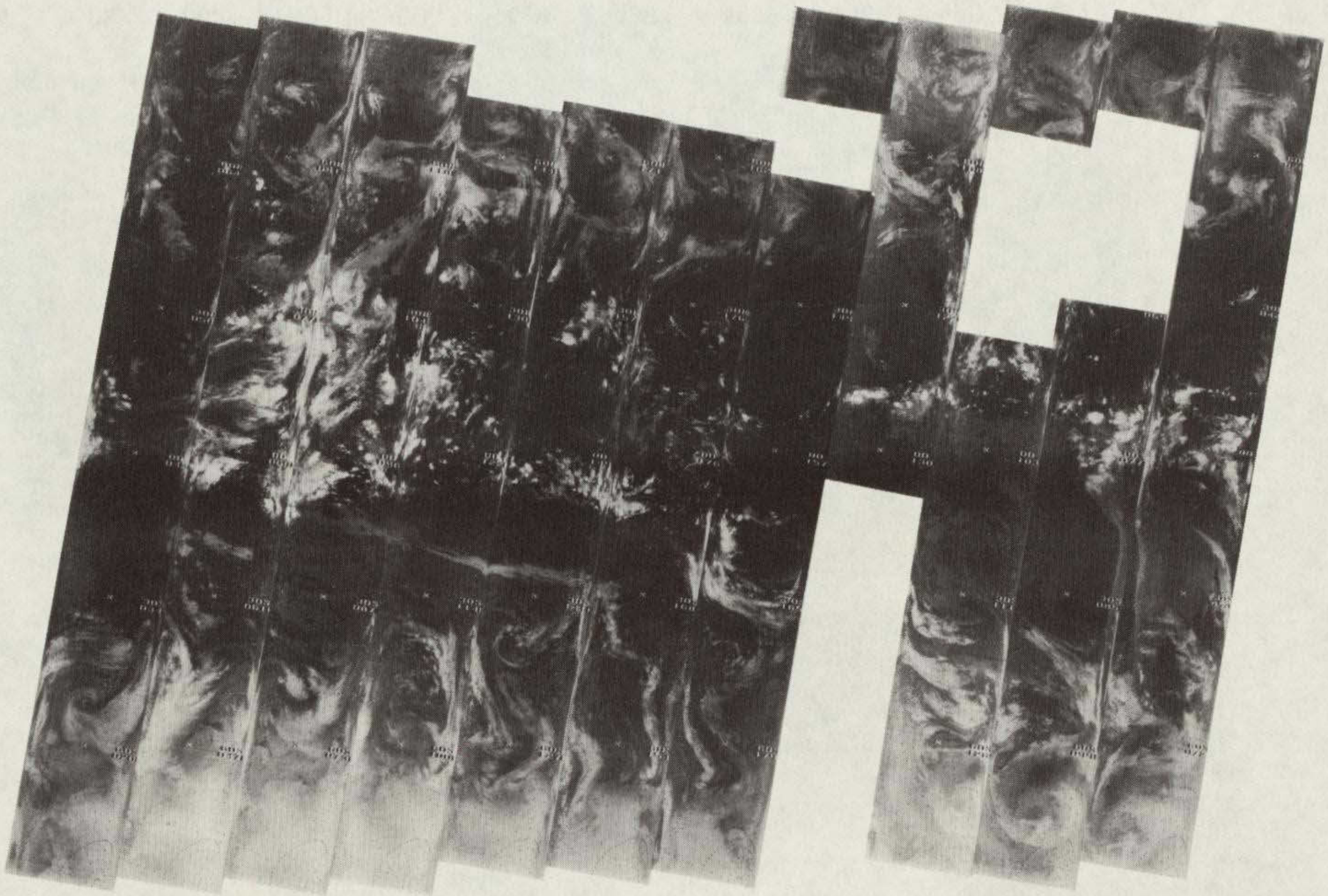
11.5 μm



492 491 490 489 488 487 486 485 484 483 482 481 480 479

18 JULY 1975

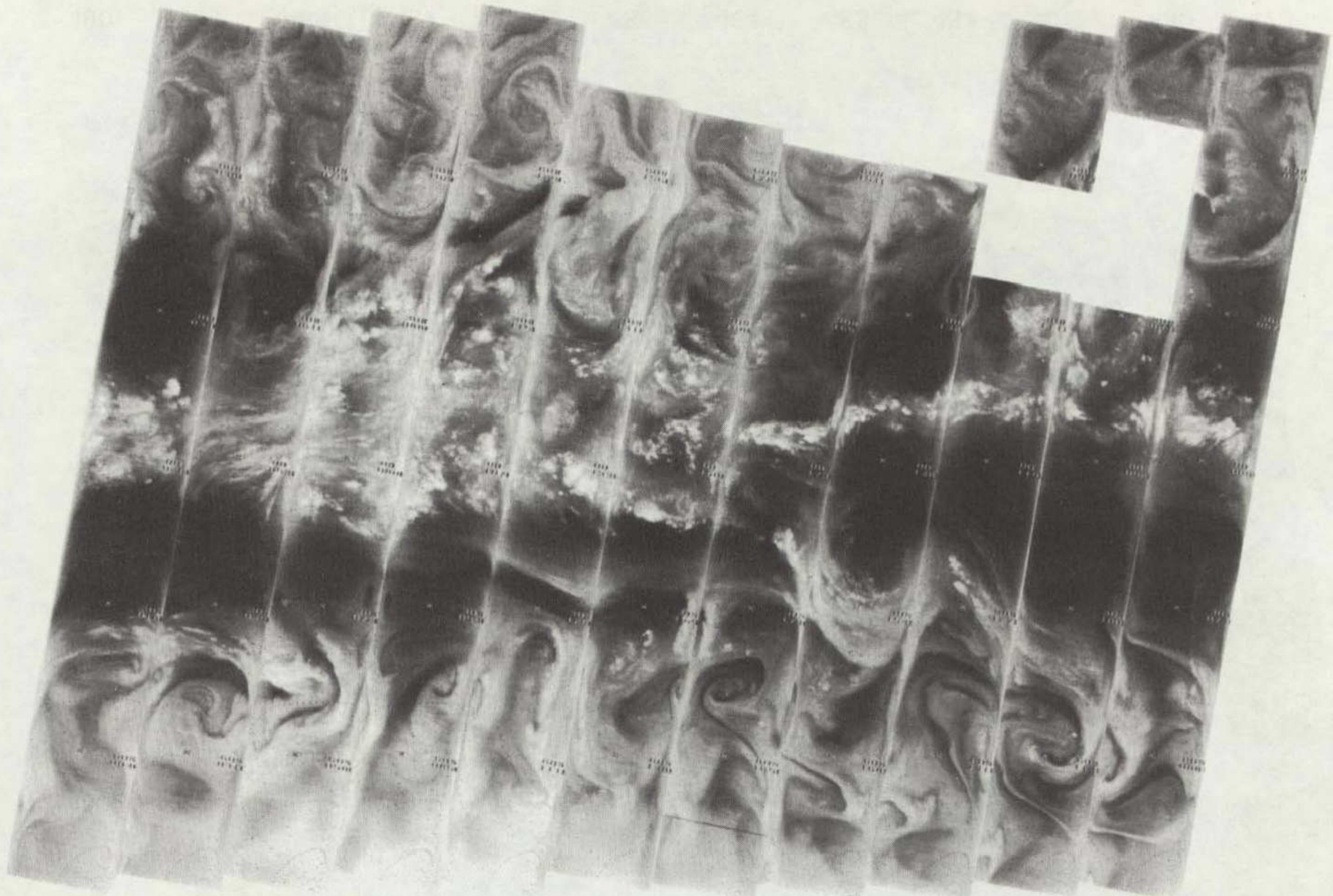
6.7 μm



492 491 490 489 488 487 486 485 484 483 482 481 480 479

18 JULY 1975

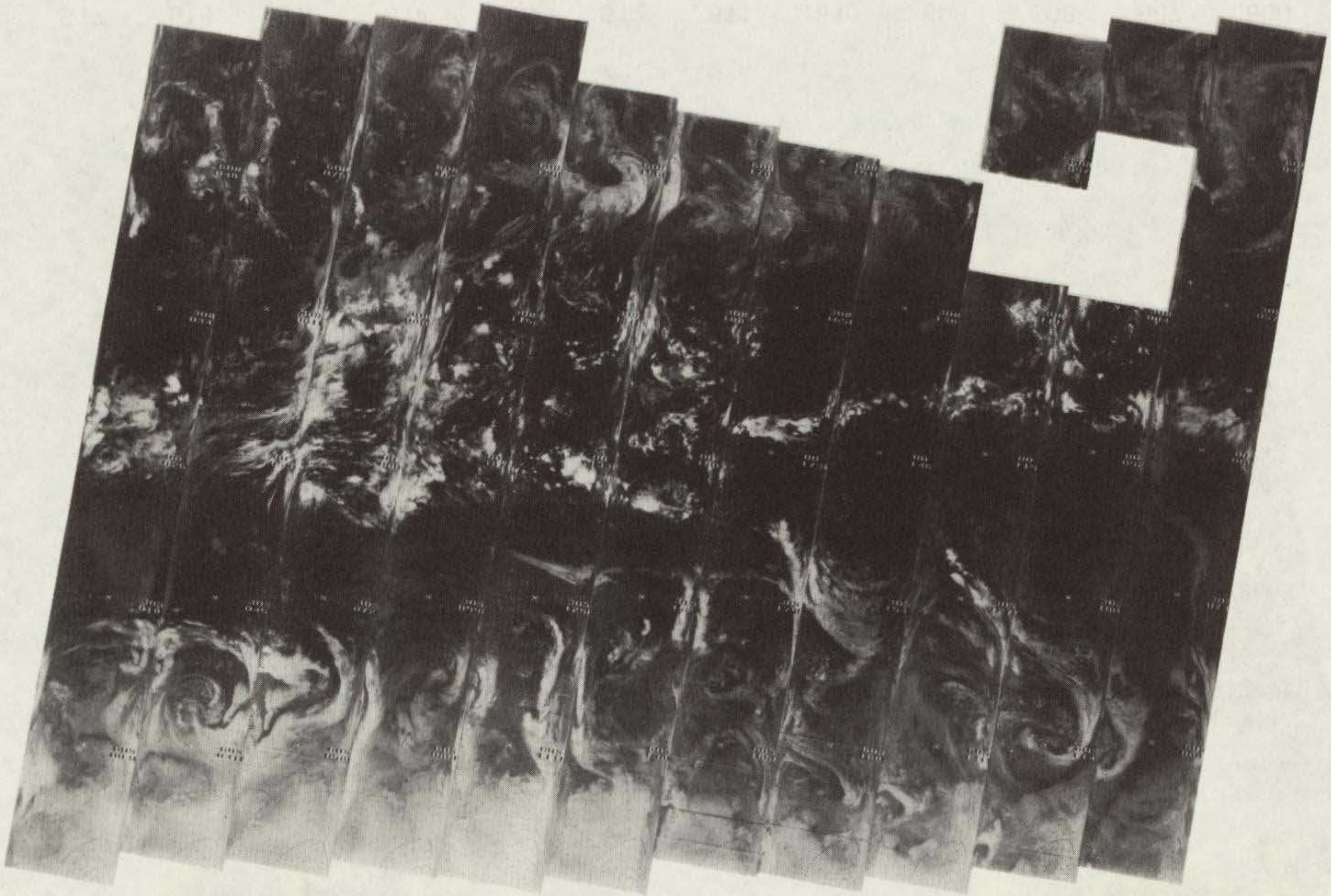
11.5 μm



505 504 503 502 501 500 499 498 497 496 495 494 493

19 JULY 1975

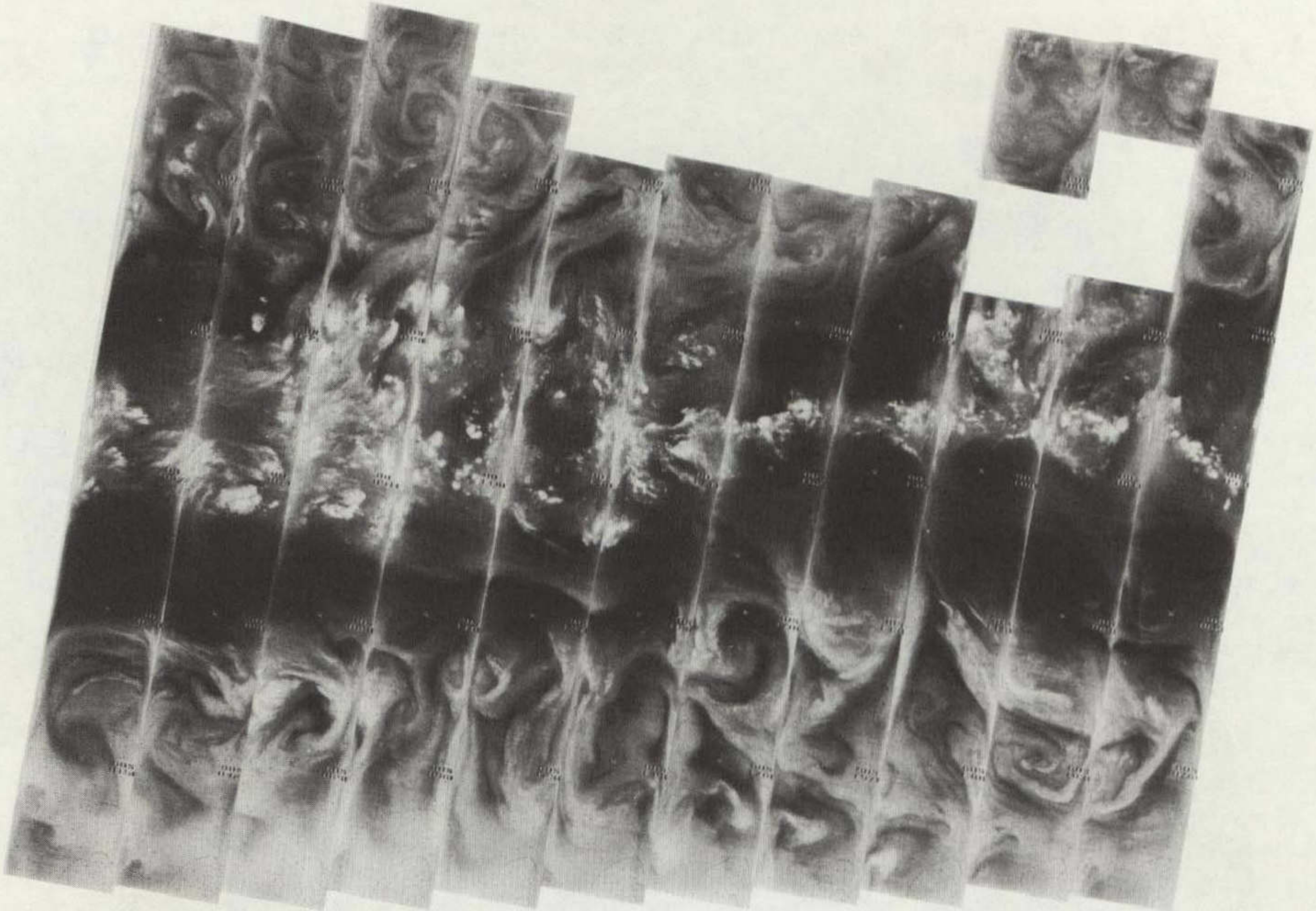
6.7 μm



505 504 503 502 501 500 499 498 497 496 495 494 493

19 JULY 1975

11.5 μm



519 518 517 516 515 514 513 512 511 510 509 508 507 506

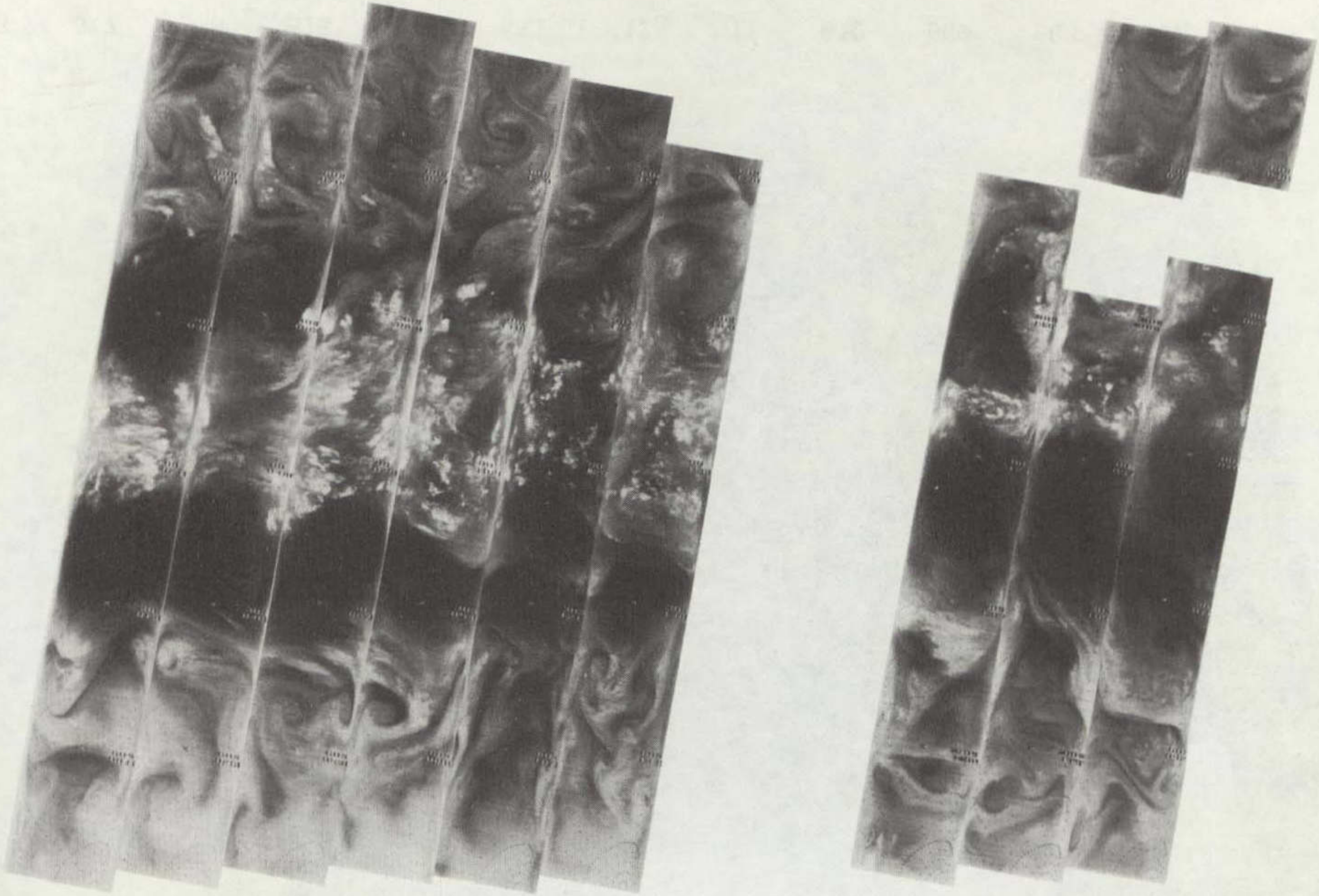
20 JULY 1975

6.7 μm

519 518 517 516 515 514 513 512 511 510 509 508 507 506

20 JULY 1975

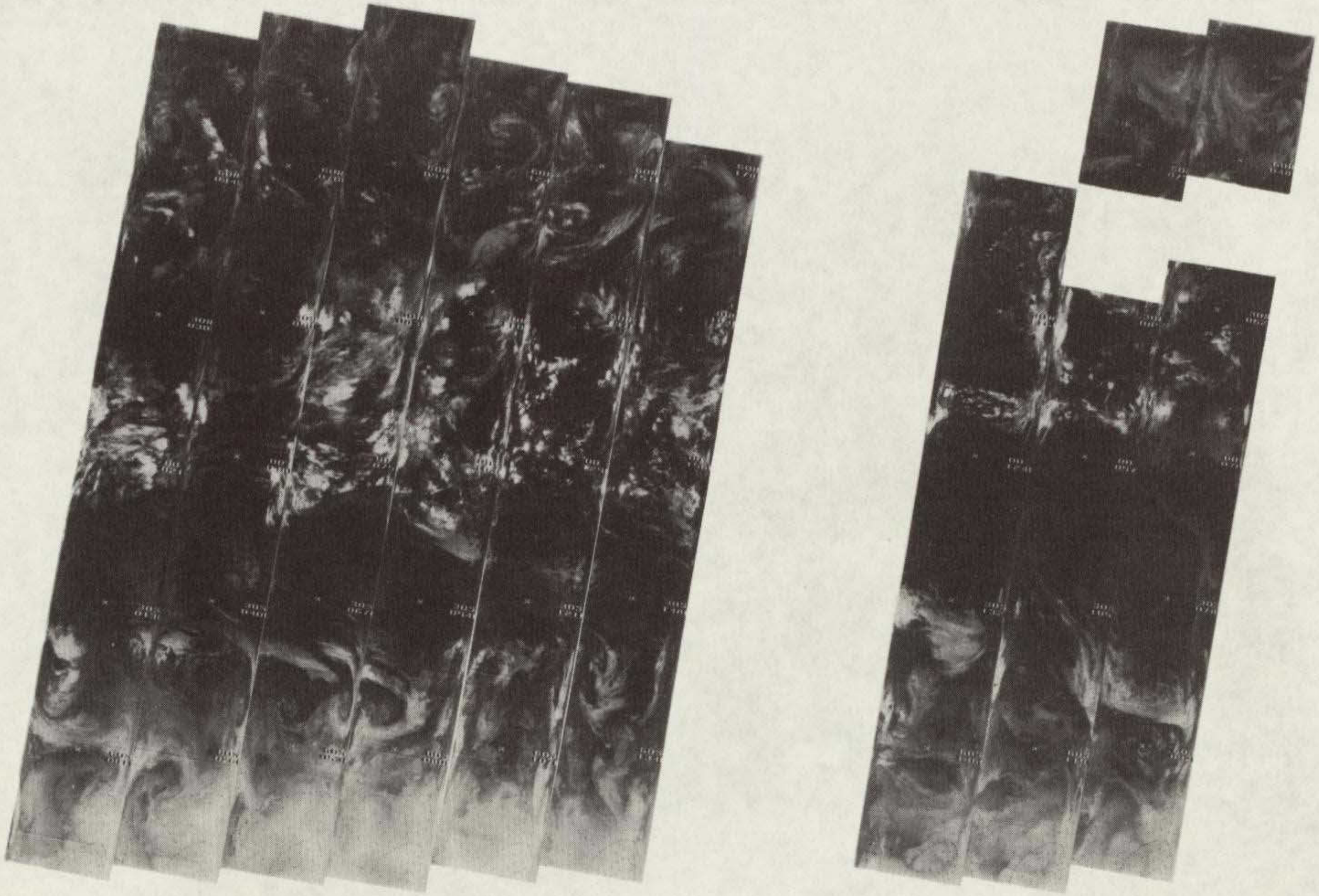
11.5 μm



532 531 530 529 528 527 526 525 524 523 522 521 520

21 JULY 1975

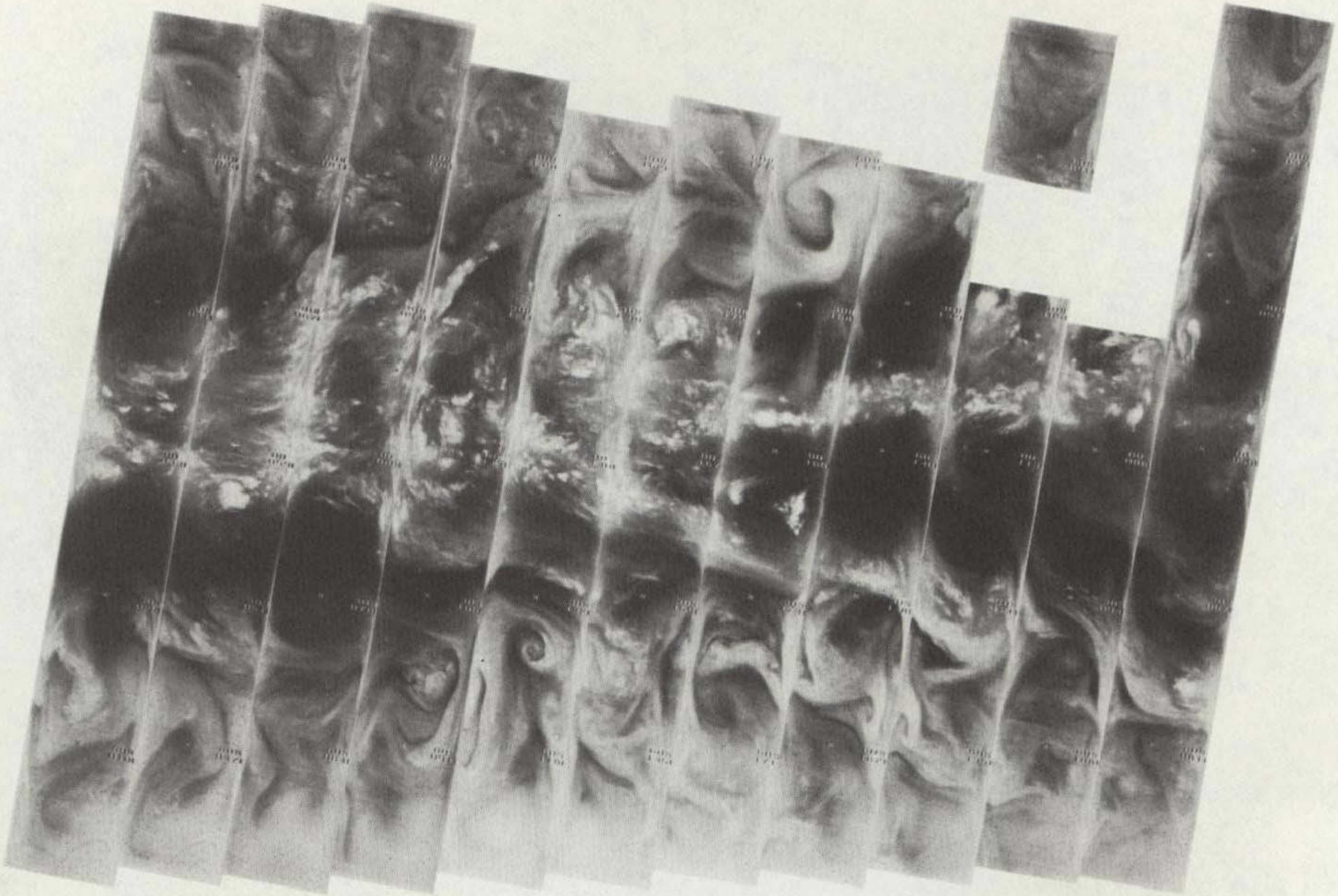
6.7 μm



532 531 530 529 528 527 526 525 524 523 522 521 520

21 JULY 1975

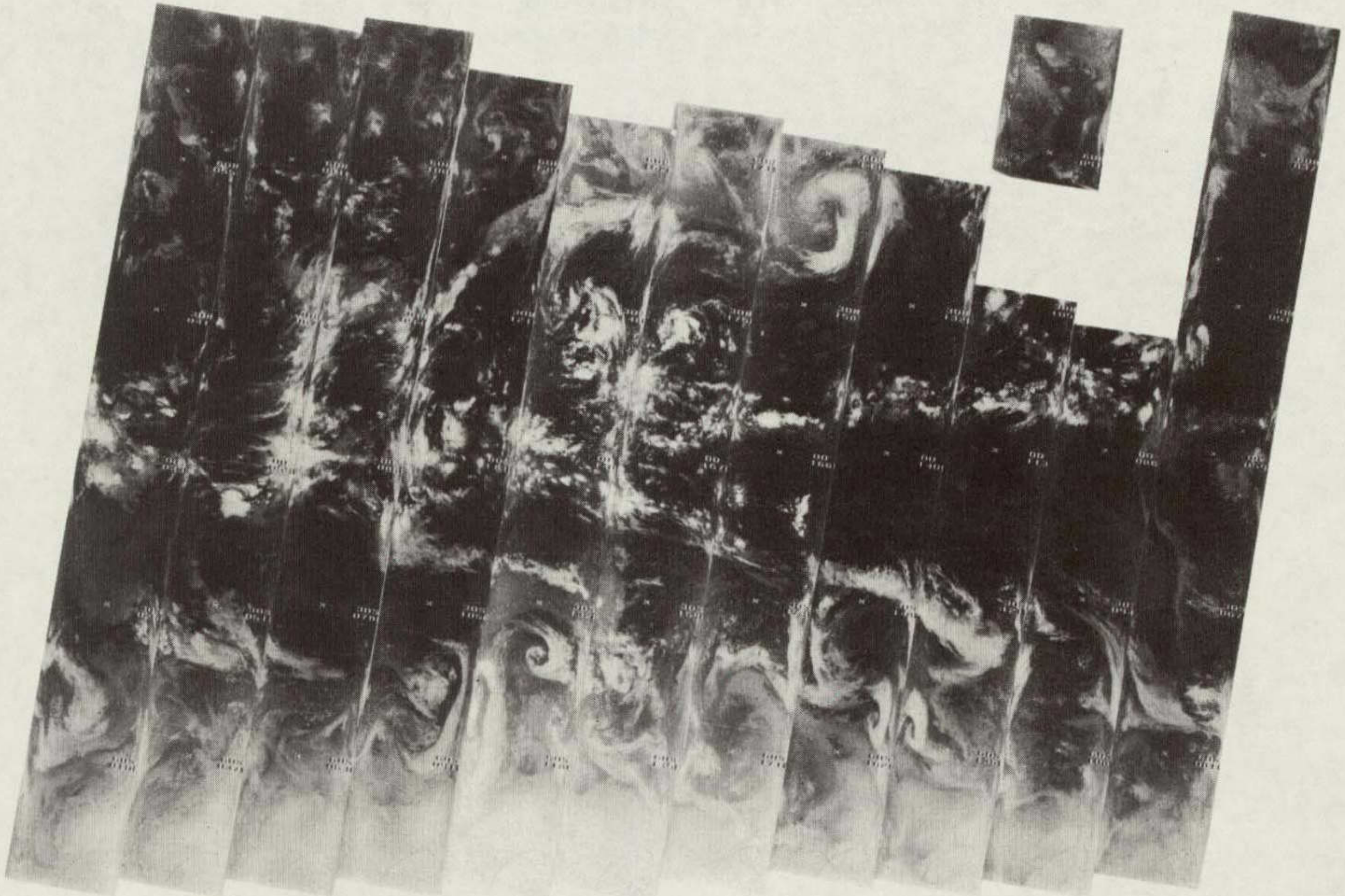
11.5 μm



545 544 543 542 541 540 539 538 537 536 535 534 533

22 JULY 1975

6.7 μm



545 544 543 542 541 540 539 538 537 536 535 534 533

22 JULY 1975

11.5 μm

559 558 557 556 555 554 553 552 551 550 549 548 547 546

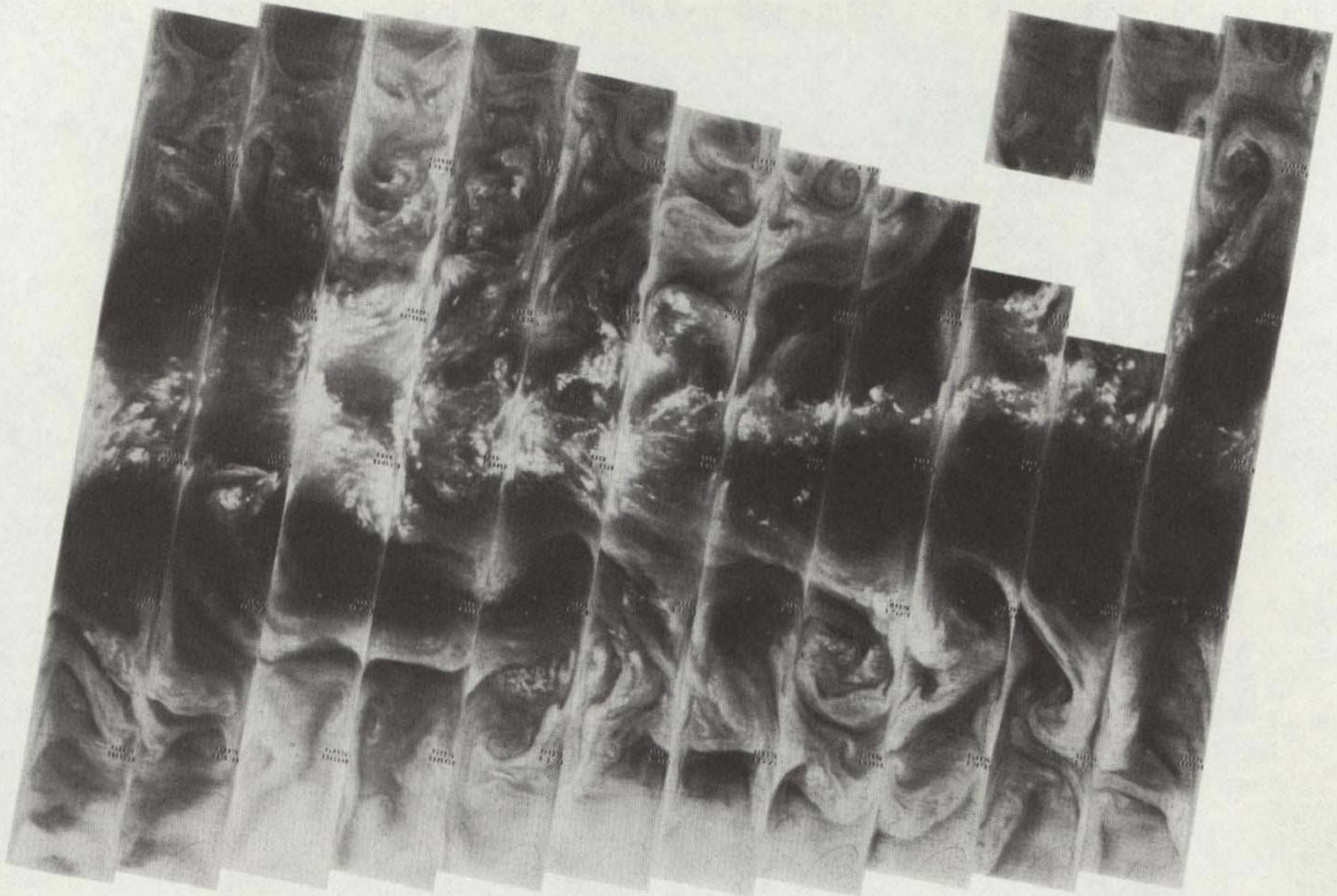
23 JULY 1975

6.7 μm

559 558 557 556 555 554 553 552 551 550 549 548 547 546

23 JULY 1975

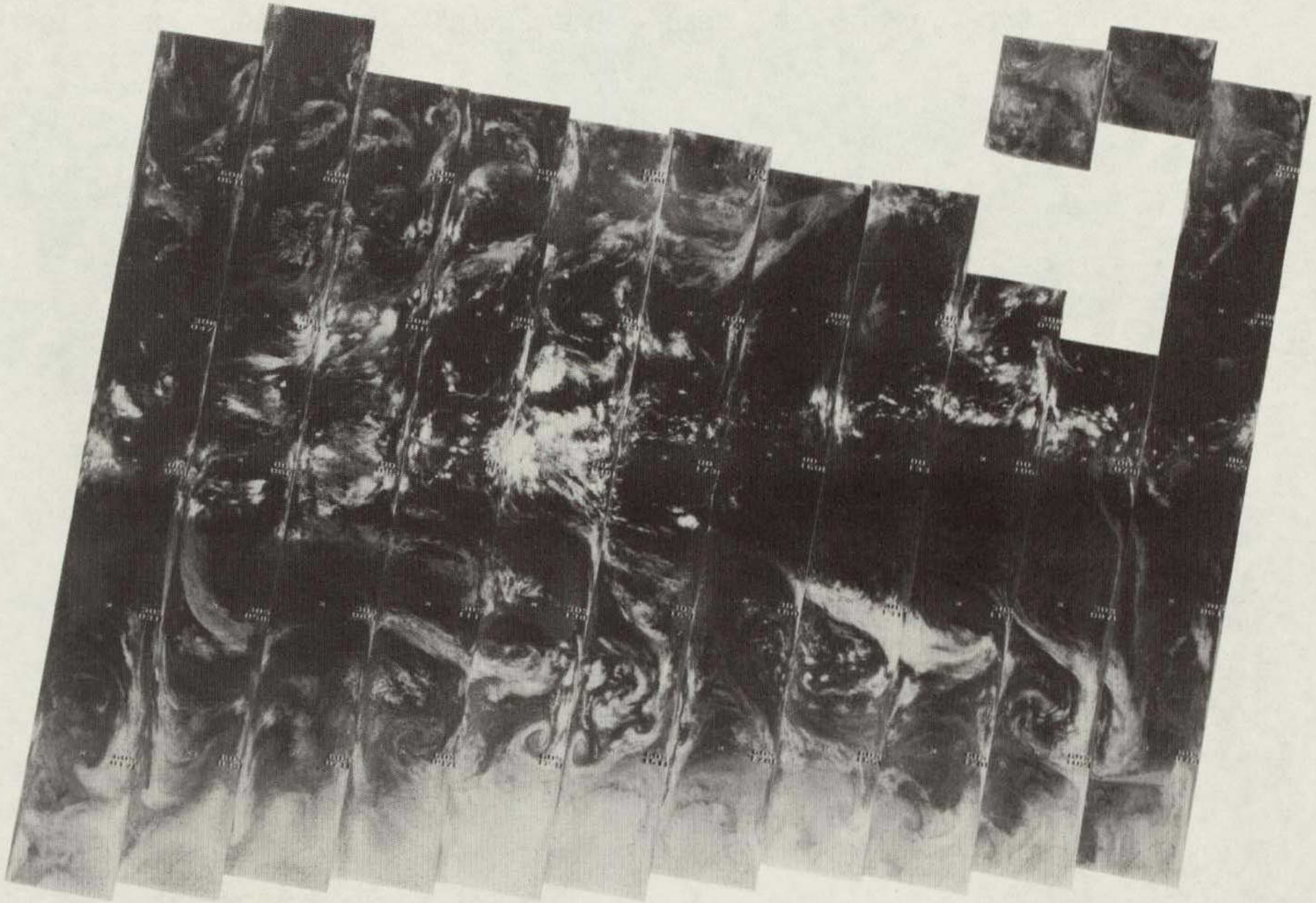
11.5 μm



572 571 570 569 568 567 566 565 564 563 562 561 560

24 JULY 1975

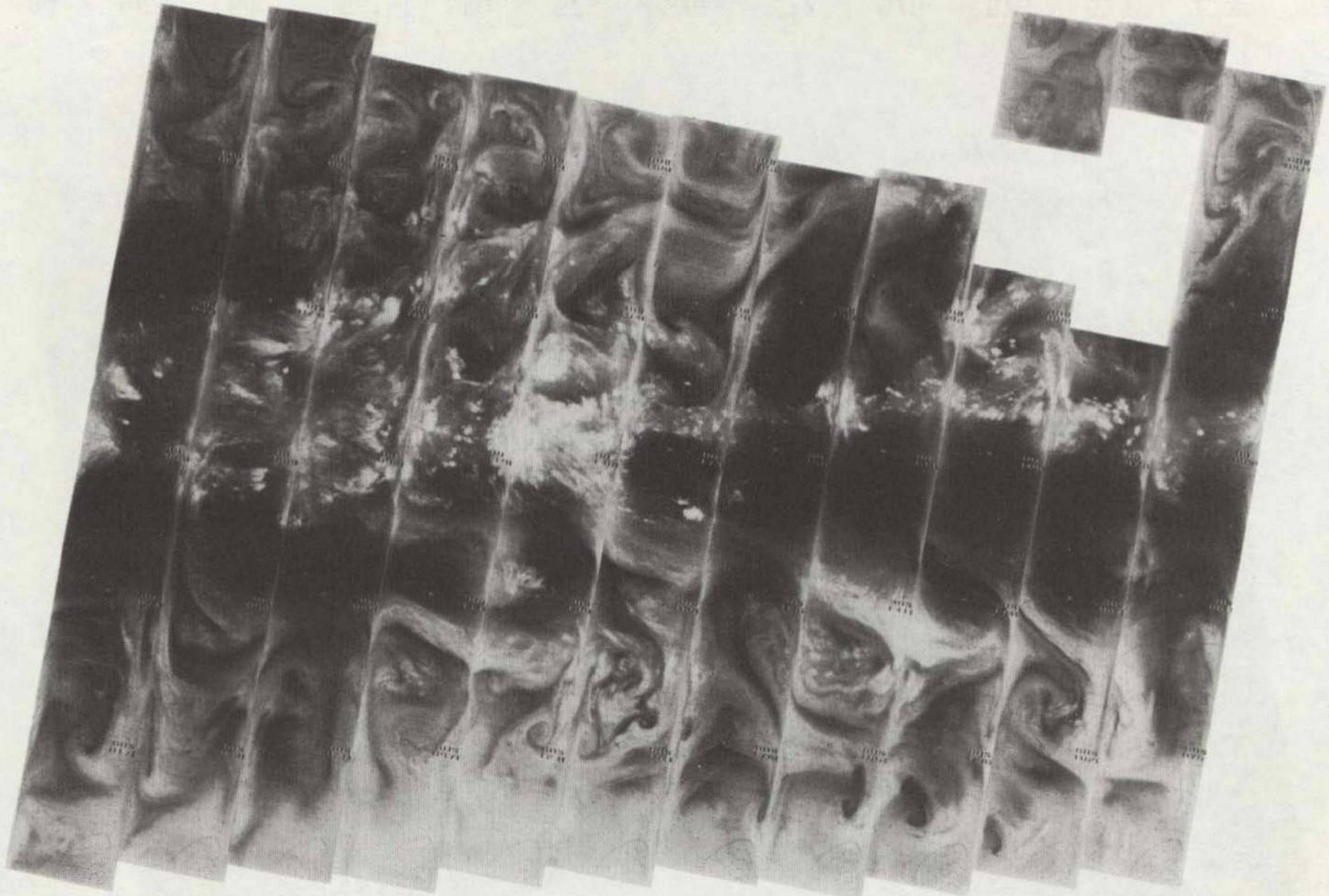
6.7 μm



586 585 584 583 582 581 580 579 578 577 576 575 574 573

24 JULY 1975

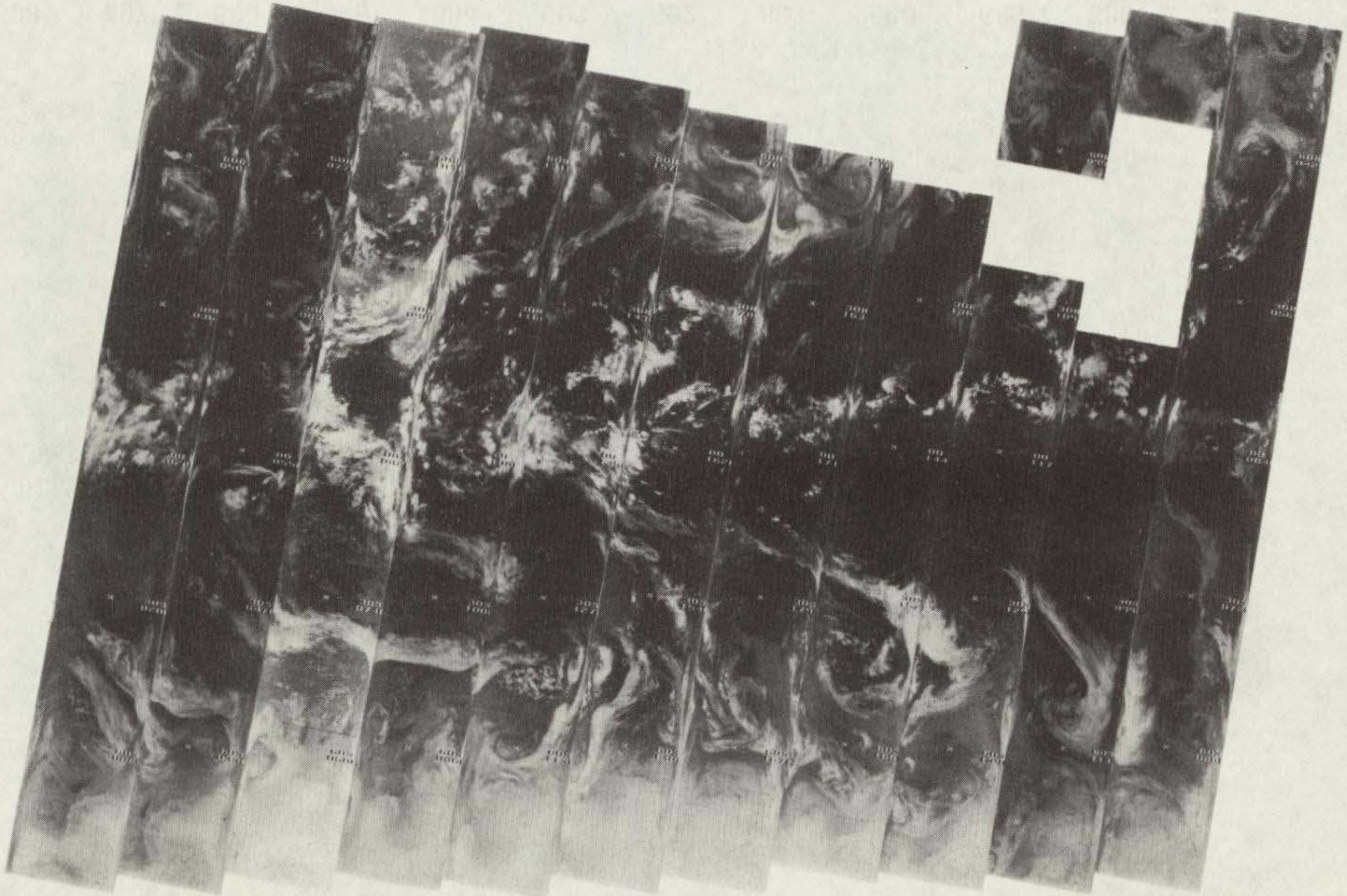
11.5 μm



586 585 584 583 582 581 580 579 578 577 576 575 574 573

25 JULY 1975

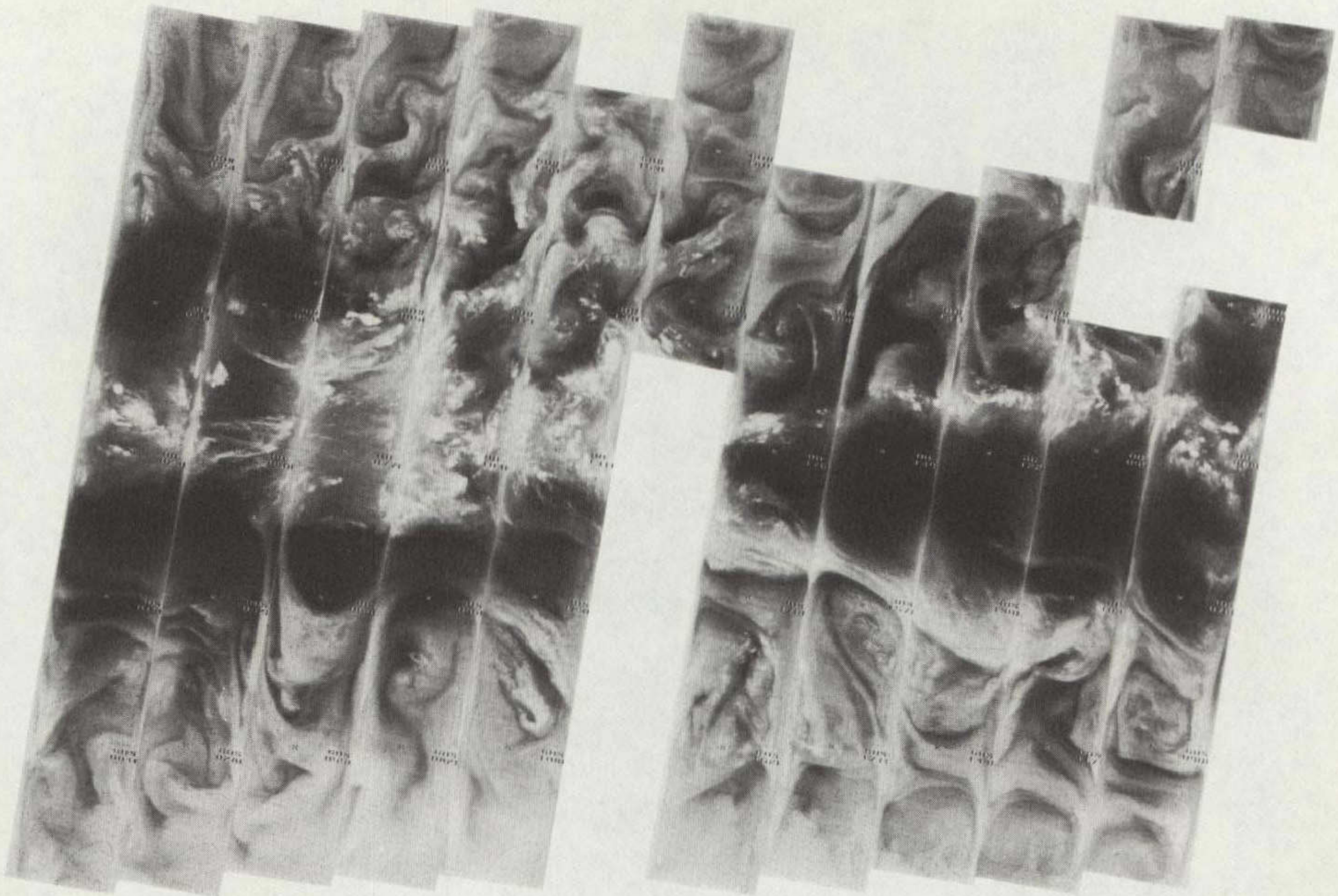
6.7 μm



572 571 570 569 568 567 566 565 564 563 562 561 560

25 JULY 1975

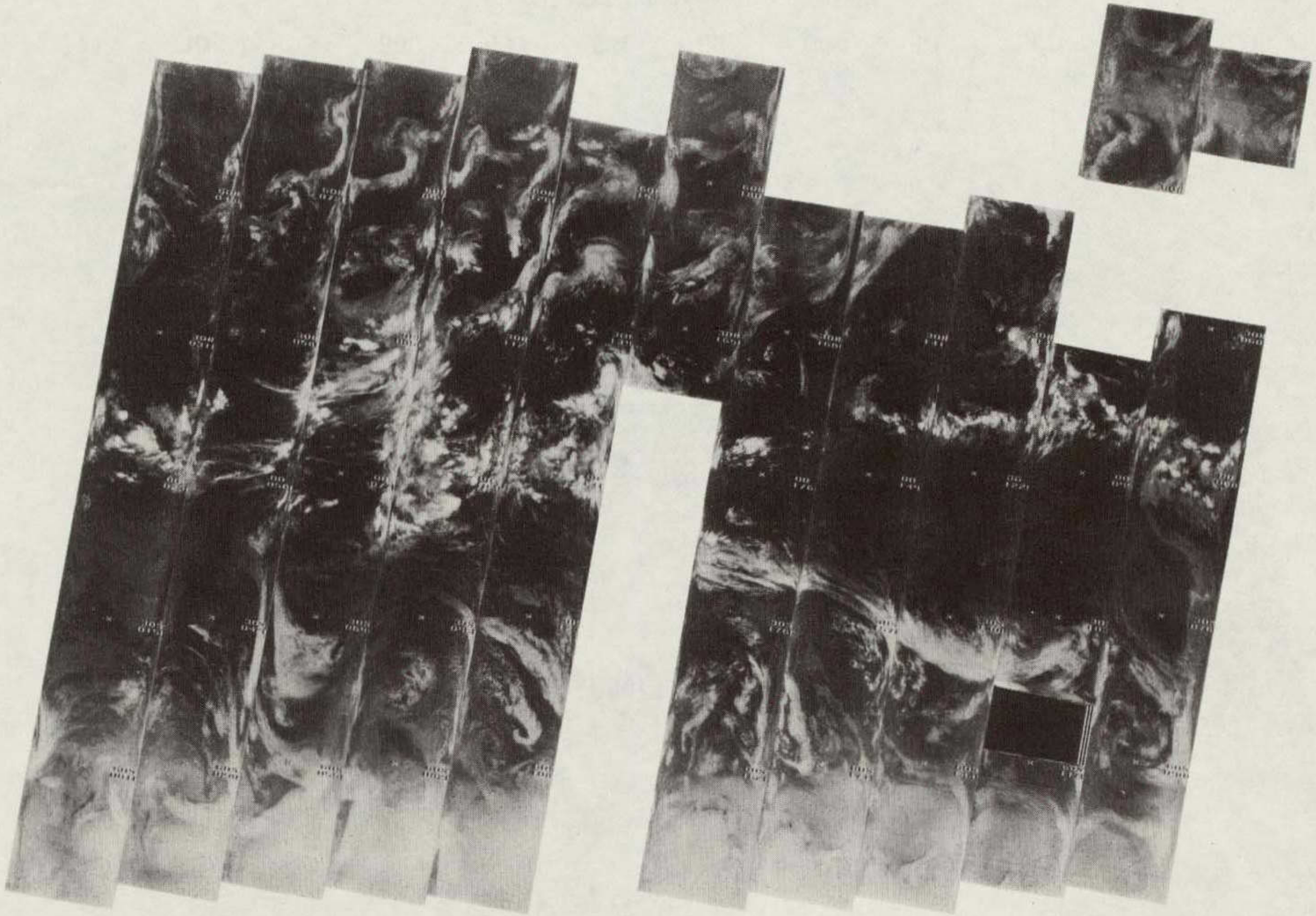
11.5 μm



599 598 597 596 595 594 593 592 591 590 589 588 587

26 JULY 1975

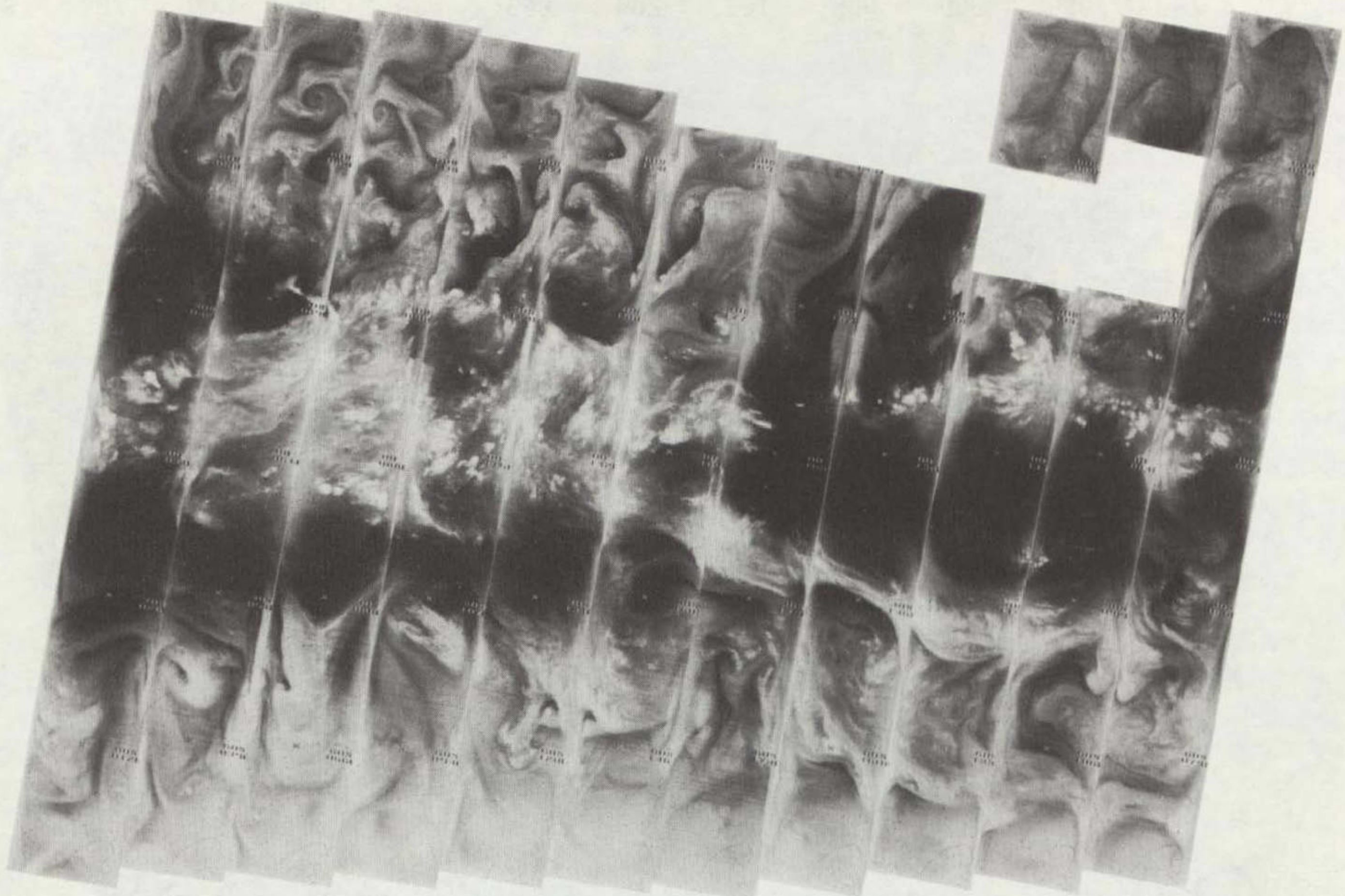
6.7 μm



599 598 597 596 595 594 593 592 591 590 589 588 587

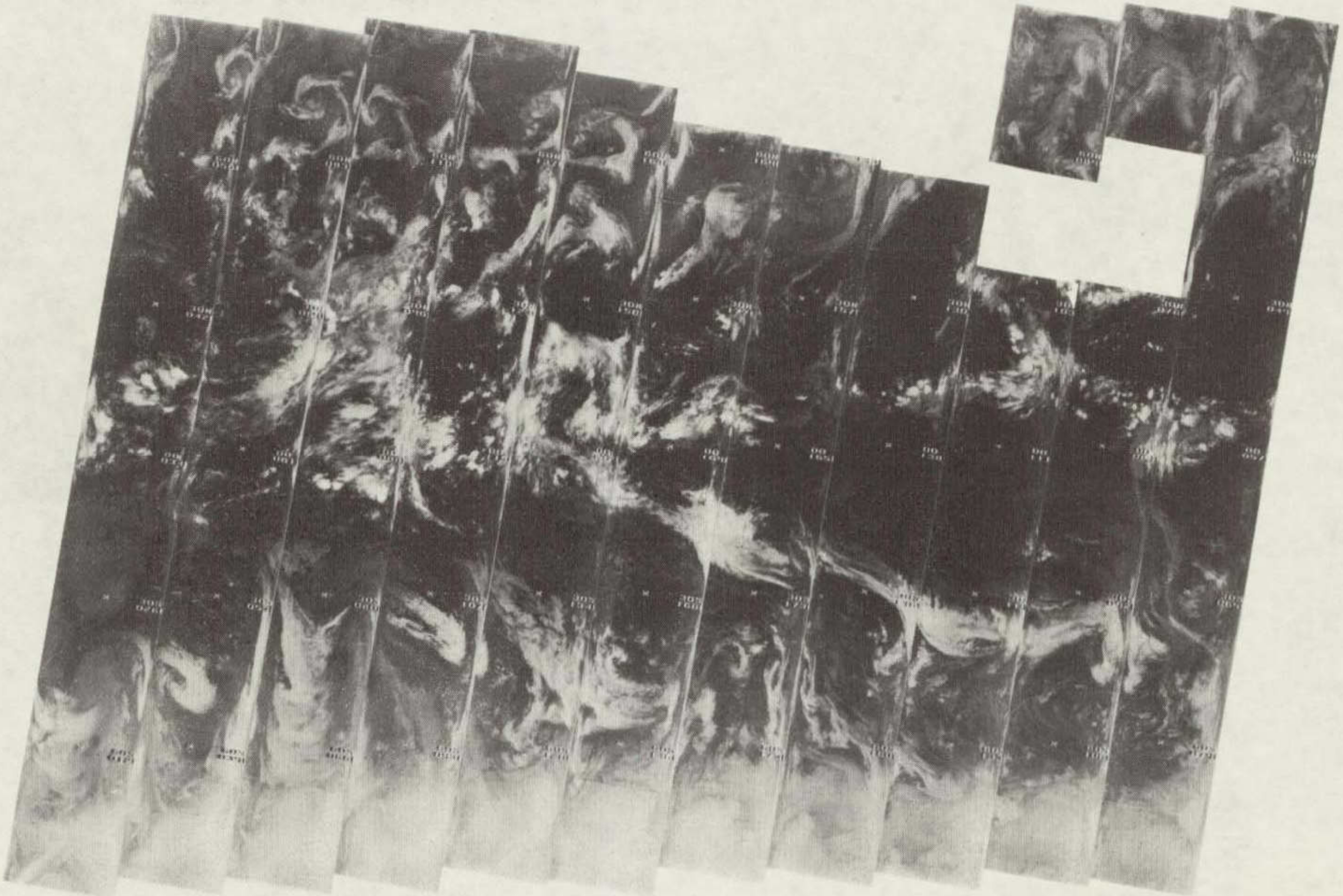
26 JULY 1975

11.5 μm



27 JULY 1975

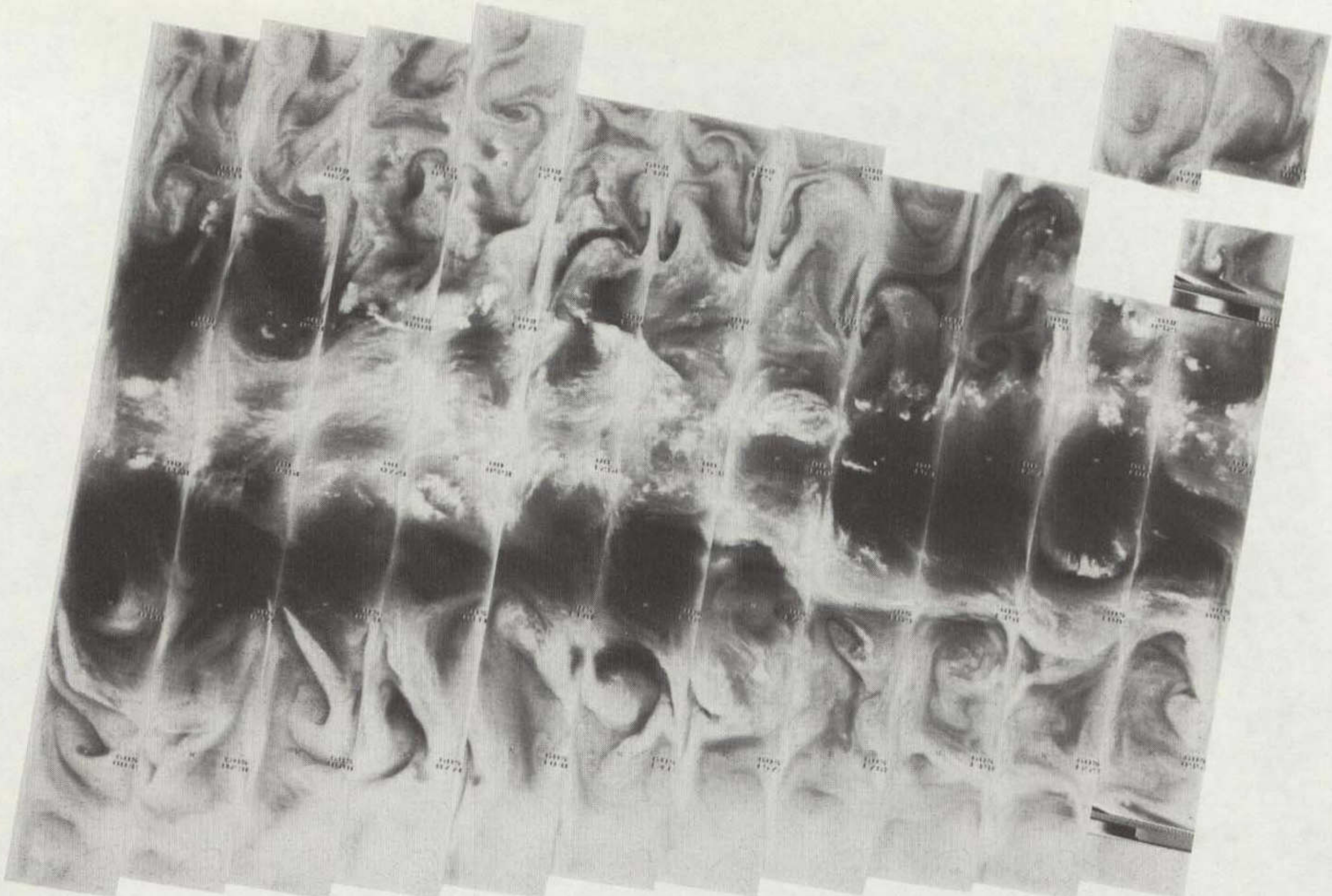
6.7 μm



612 611 610 609 608 607 606 605 604 603 602 601 600

27 JULY 1975

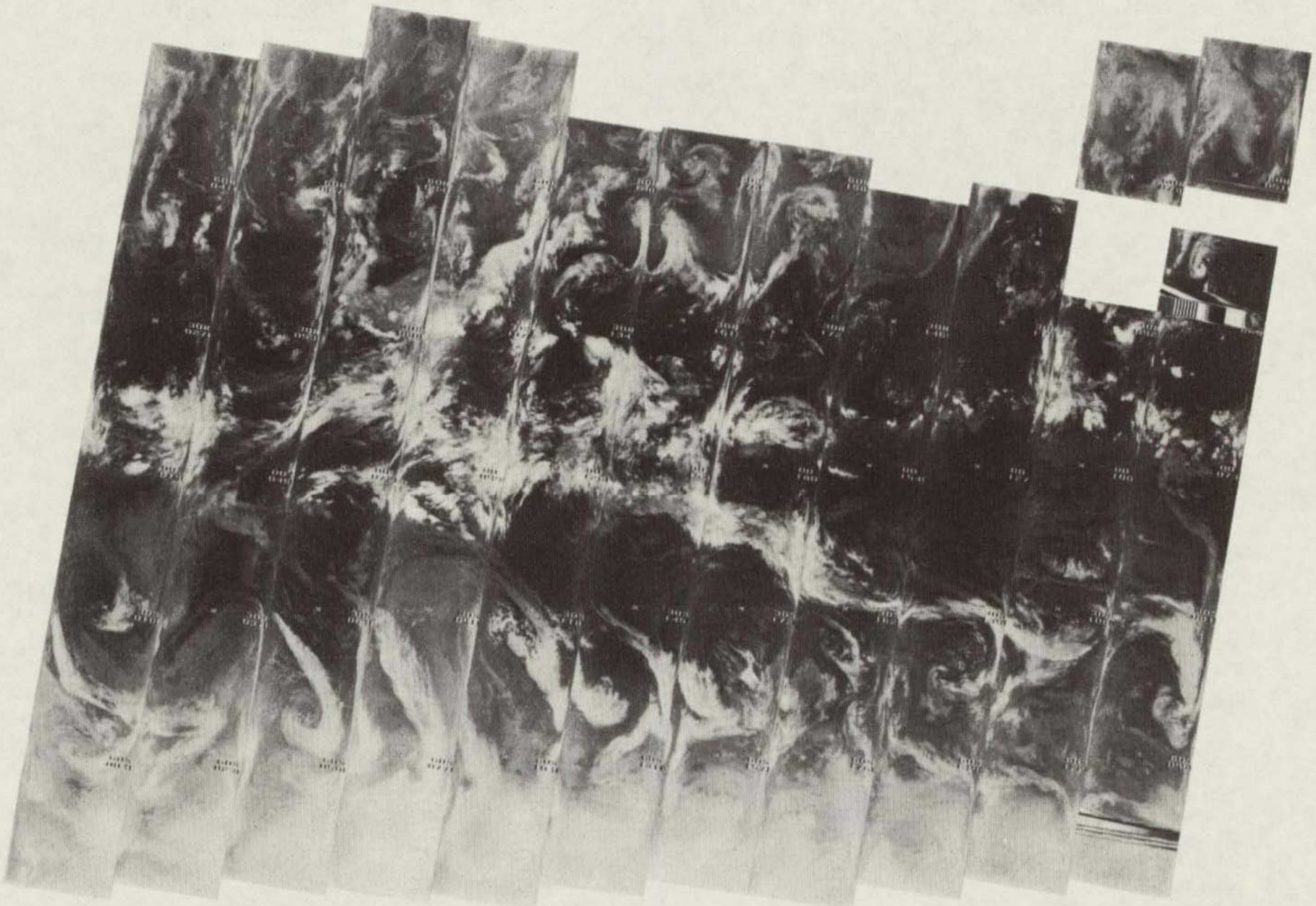
11.5 μm



626 625 624 623 622 621 620 619 618 617 616 615 614 613

28 JULY 1975

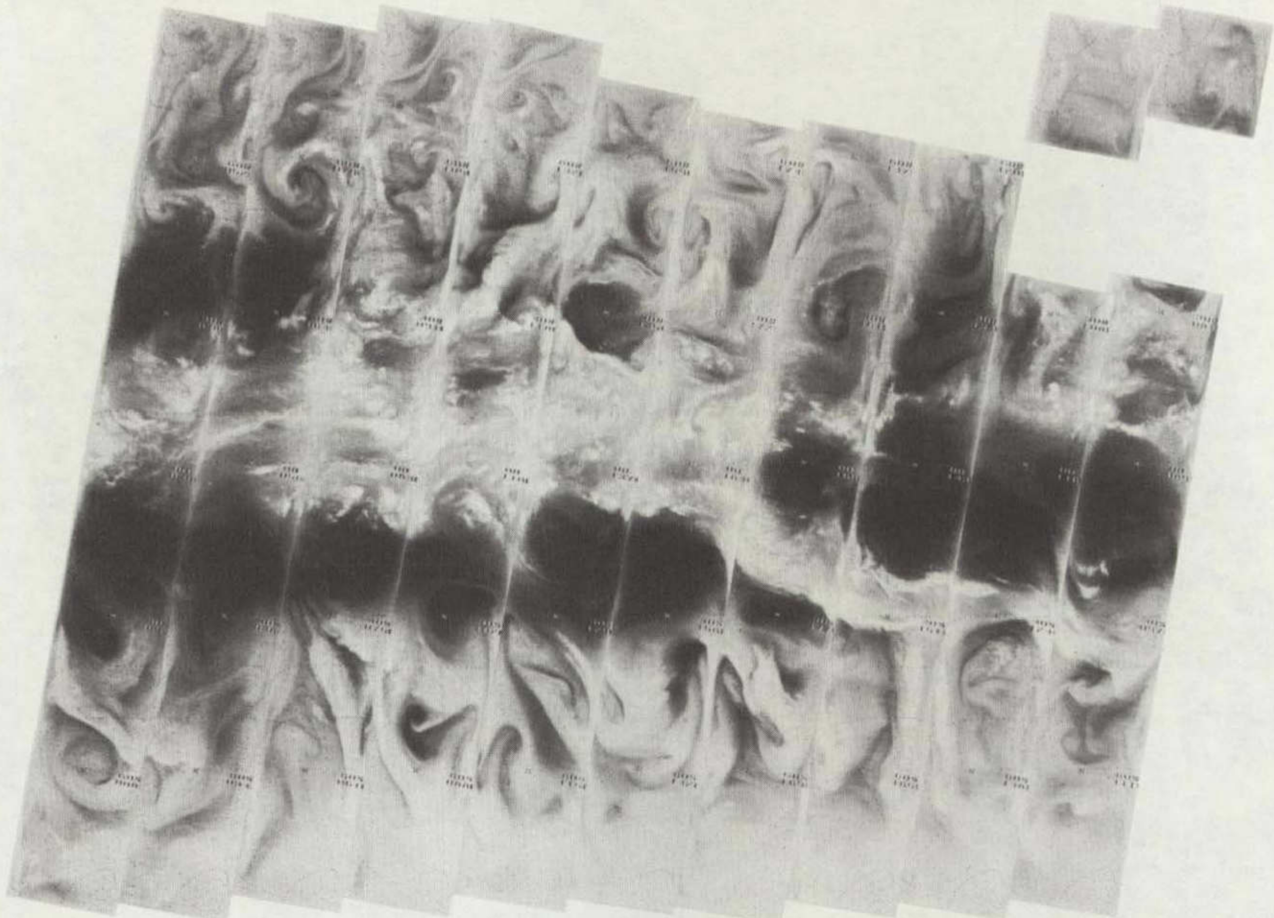
6.7 μm



626 625 624 623 622 621 620 619 618 617 616 615 614 613

28 JULY 1975

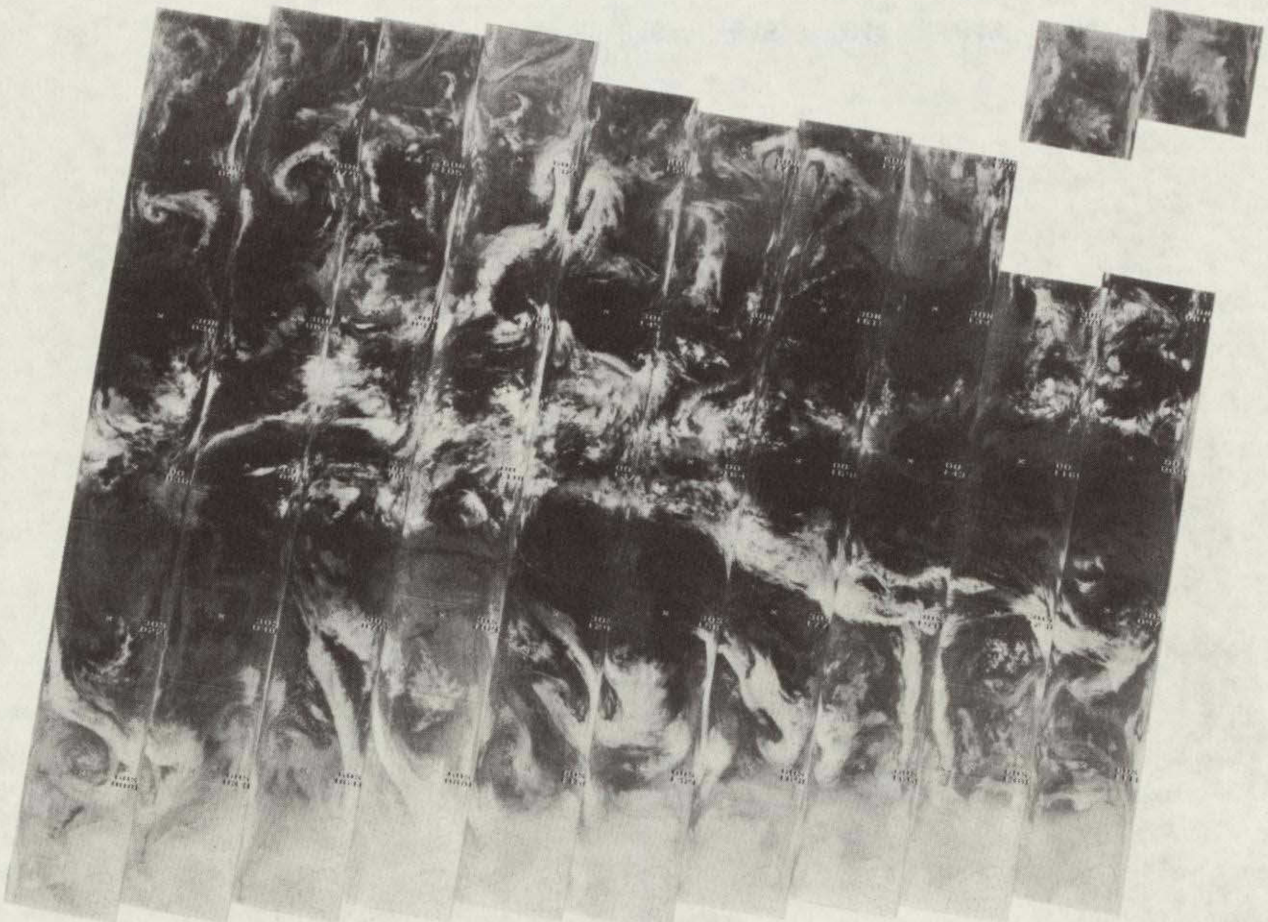
11.5 μm



639 638 637 636 635 634 633 632 631 630 629 628 627

29 JULY 1975

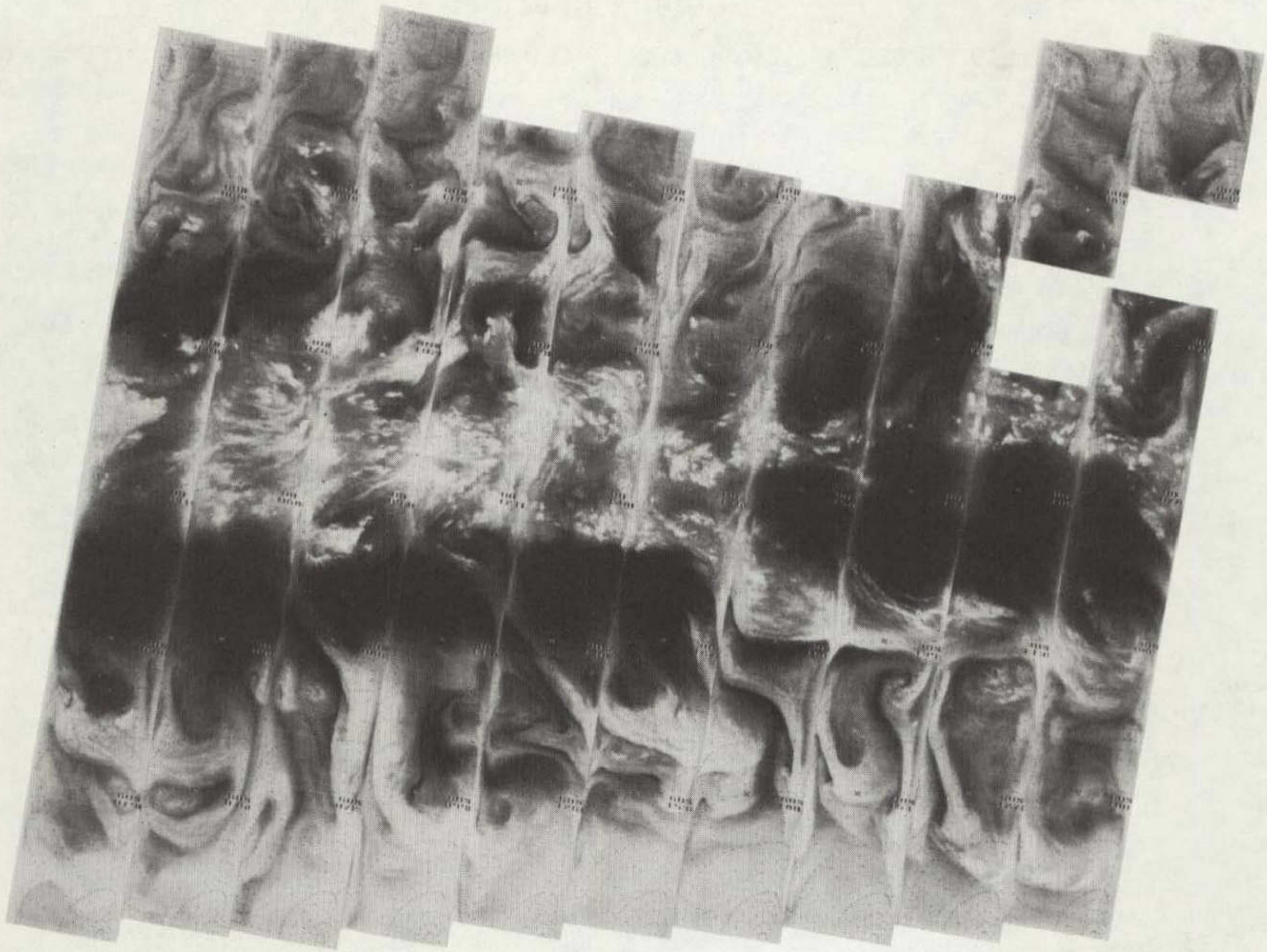
6.7 μm



639 638 637 636 635 634 633 632 631 630 629 628 627

29 JULY 1975

11.5 μm



653 652 651 650 649 648 647 646 645 644 643 642 641 640

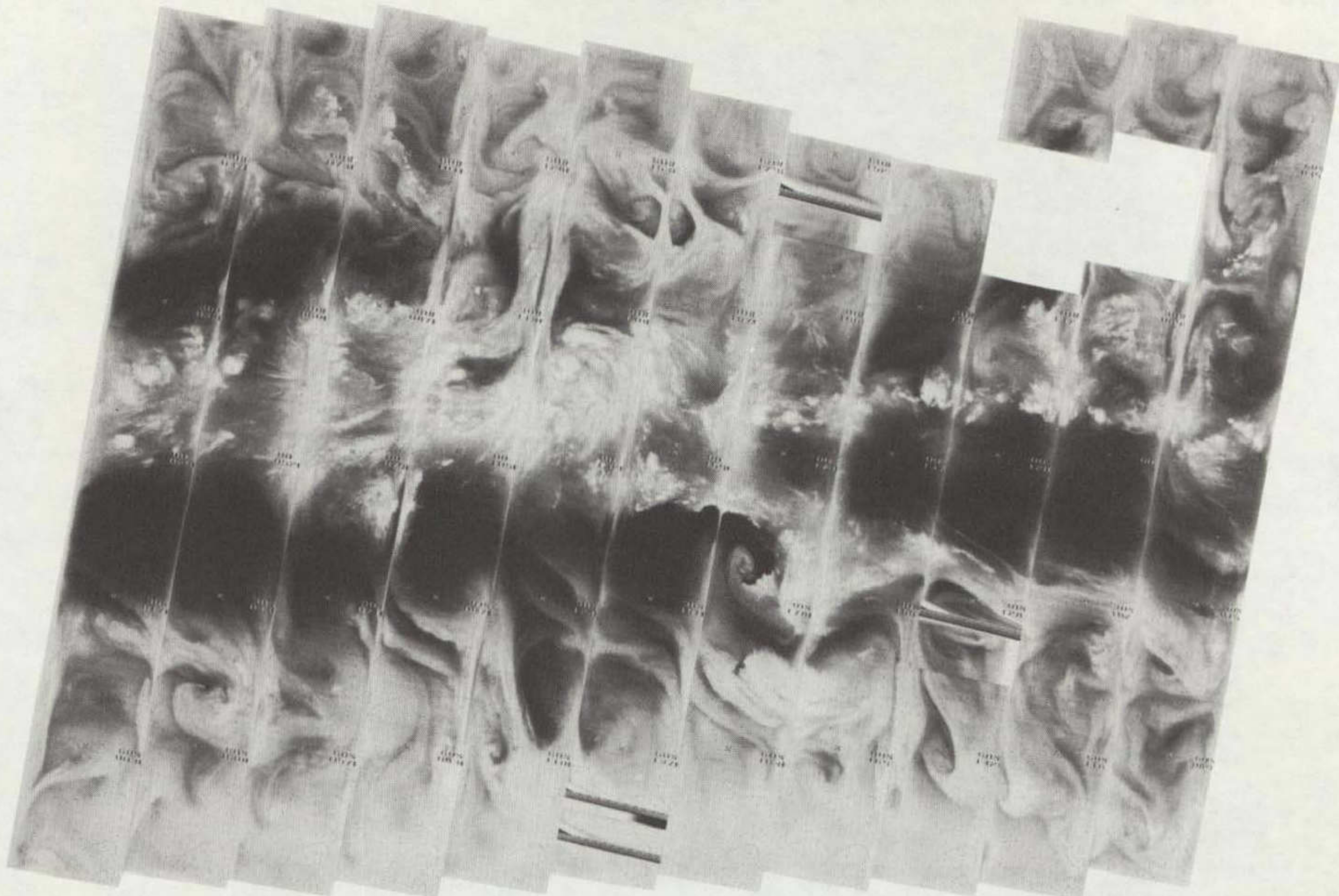
30 JULY 1975

6.7 μm

653 652 651 650 649 648 647 646 645 644 643 642 641 640

30 JULY 1975

11.5 μm



666 665 664 663 662 661 660 659 658 657 656 655 654

31 JULY 1975

6.7 μm

666 665 664 663 662 661 660 659 658 657 656 655 654

31 JULY 1975

11.5 μm

680 679 678 677 676 675 674 673 672 671 670 669 668 667

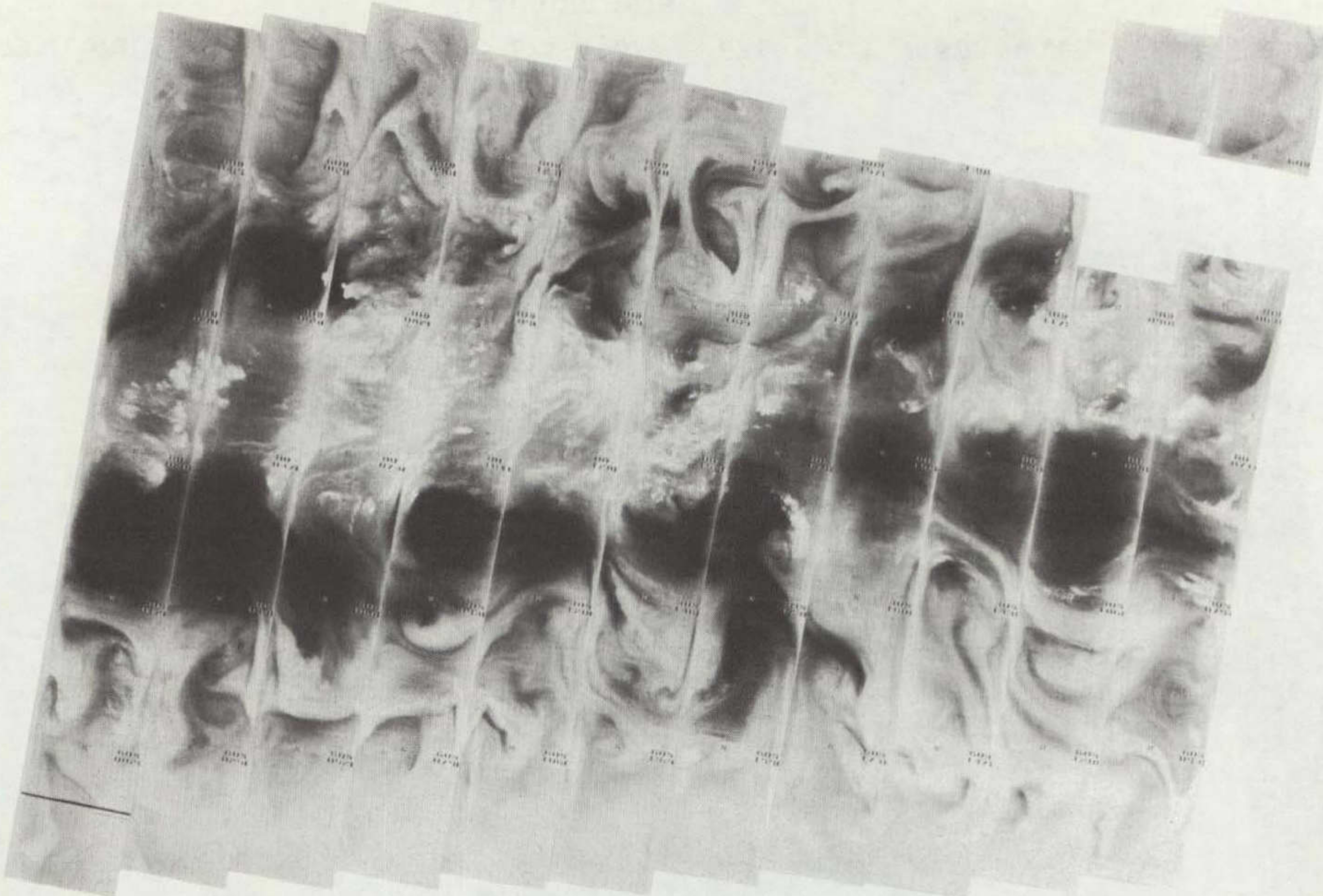
1 AUGUST 1975

6.7 μm

680 679 678 677 676 675 674 673 672 671 670 669 668 667

1 AUGUST 1975

11.5 μm



693 692 691 690 689 688 687 686 685 684 683 682 681

2 AUGUST 1975

6.7 μm

693 692 691 690 689 688 687 686 685 684 683 682 681

2 AUGUST 1975

11.5 μm

706 705 704 703 702 701 700 699 698 697 696 695 694

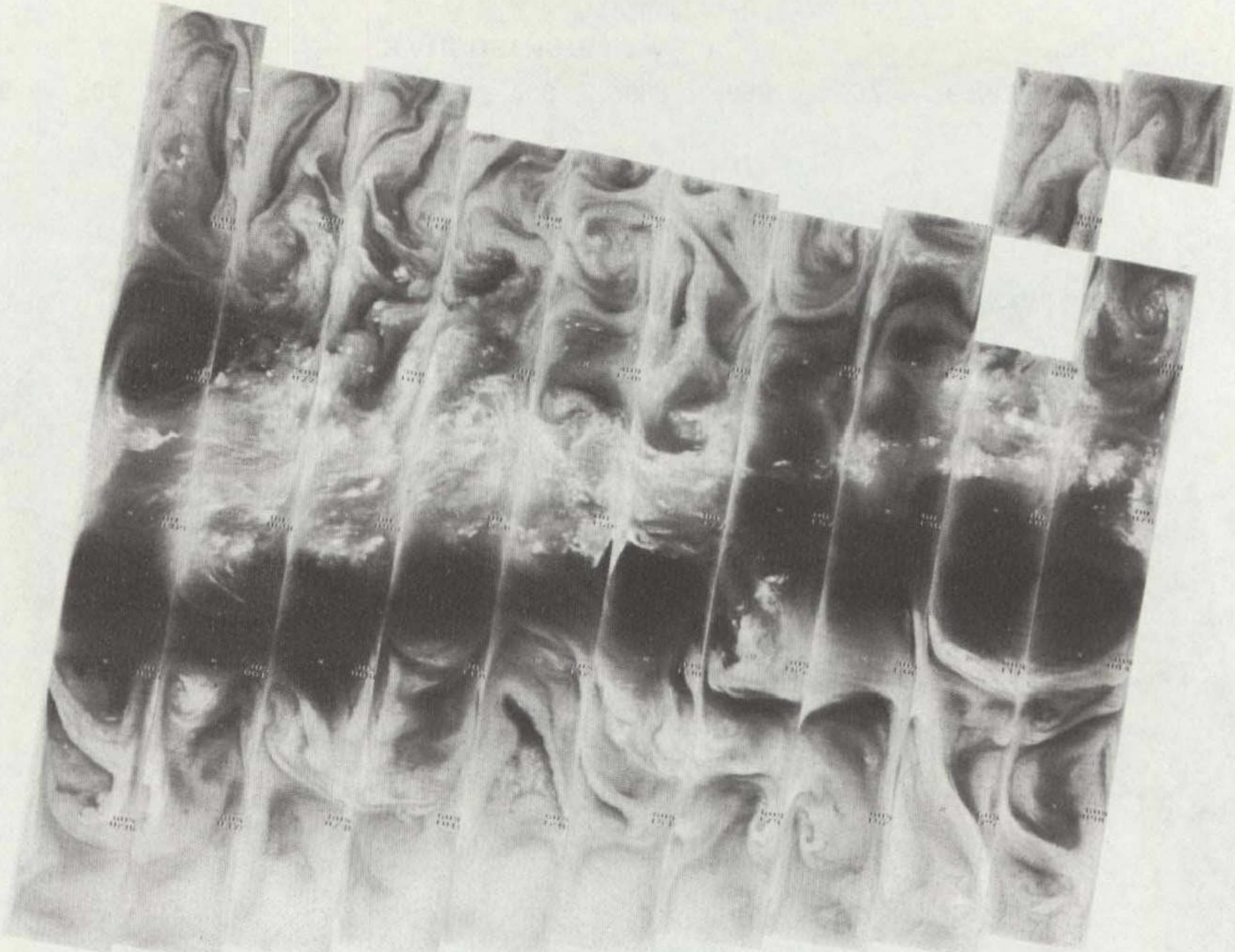
3 AUGUST 1975

6.7 μm

706 705 704 703 702 701 700 699 698 697 696 695 694

3 AUGUST 1975

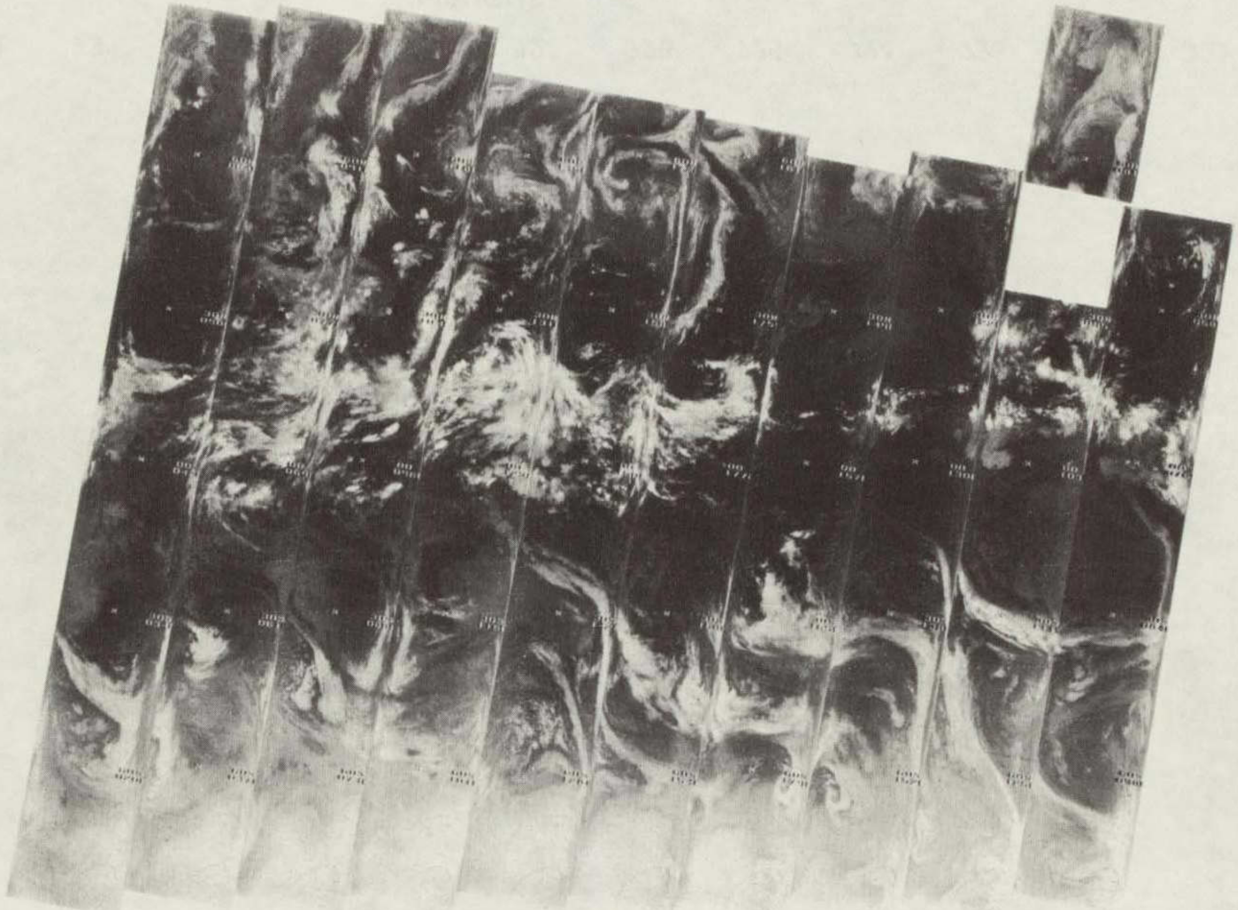
11.5 μm



720 719 718 717 716 715 714 713 712 711 710 709 708 707

4 AUGUST 1975

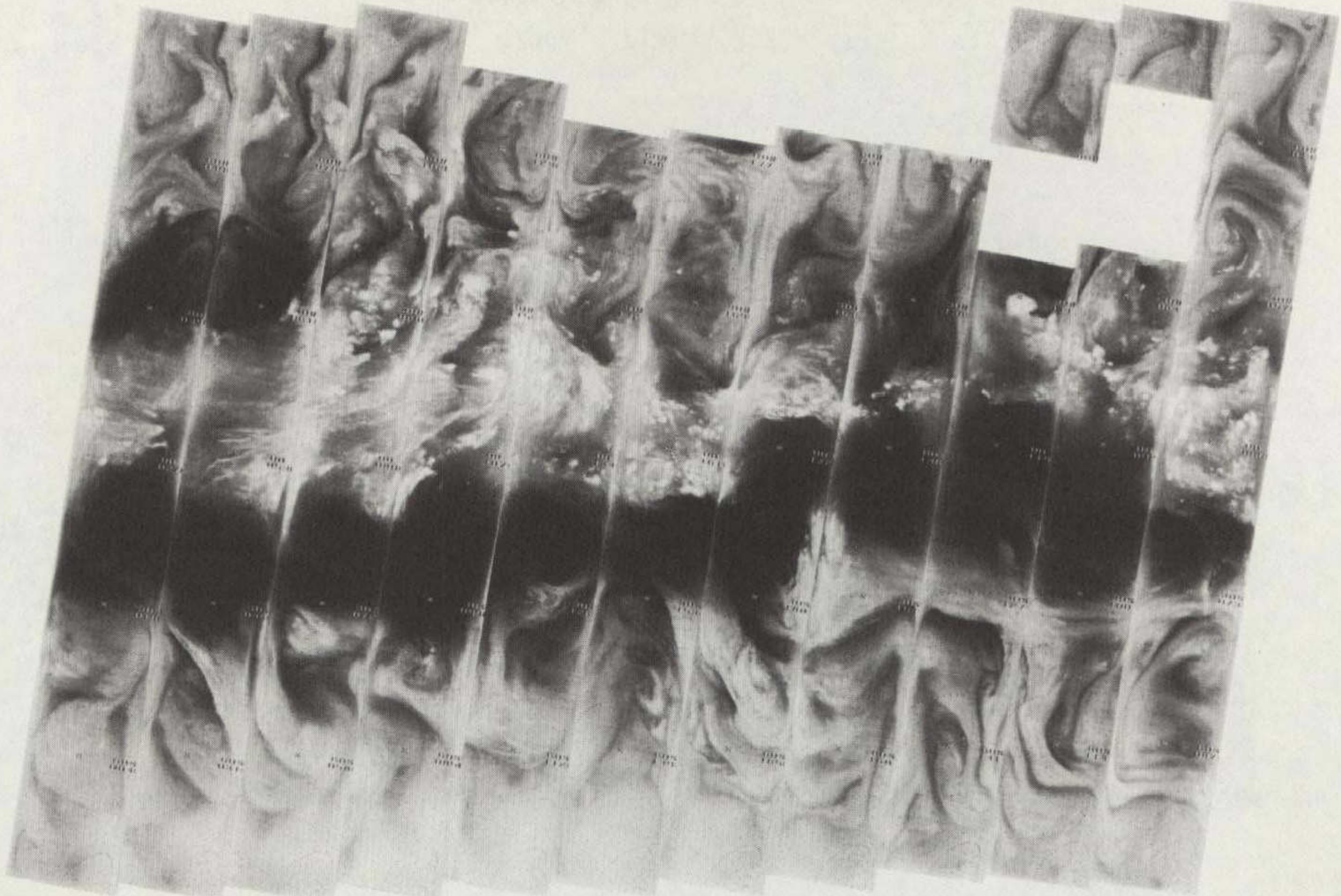
6.7 μm



720 719 718 717 716 715 714 713 712 711 710 709 708 707

4 AUGUST 1975

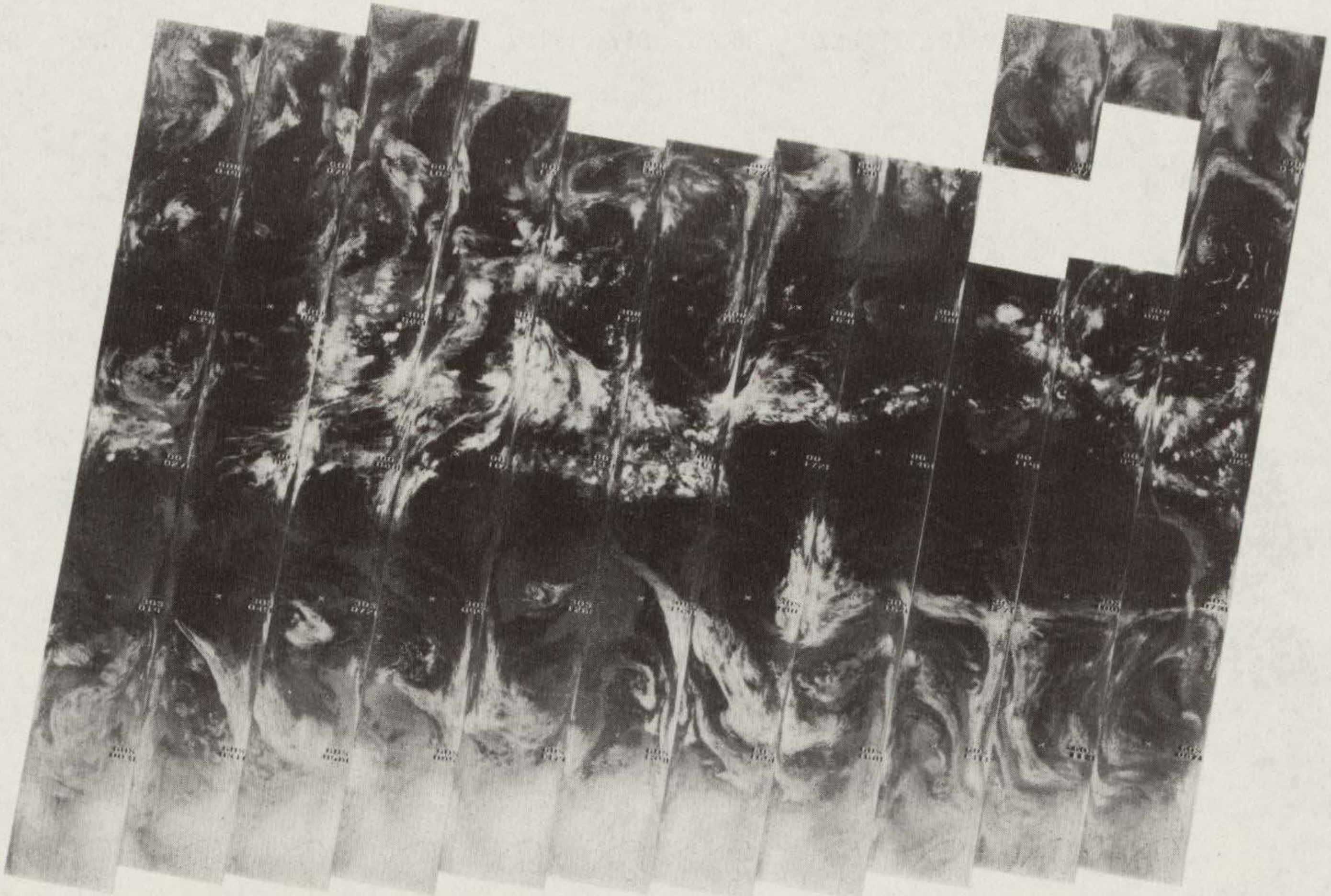
11.5 μm



733 732 731 730 729 728 727 726 725 724 723 722 721

5 AUGUST 1975

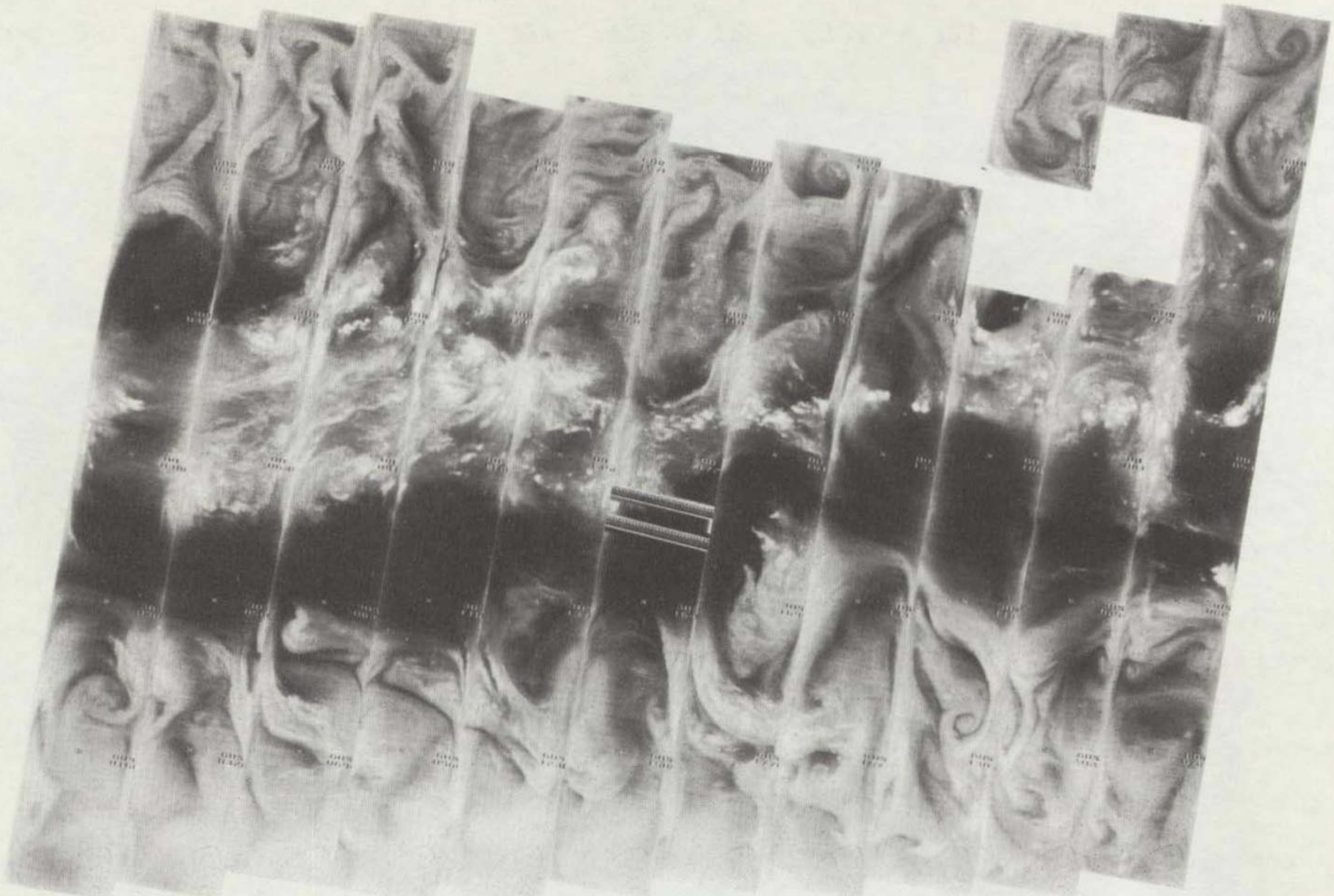
6.7 μm



733 732 731 730 729 728 727 726 725 724 723 722 721

5 AUGUST 1975

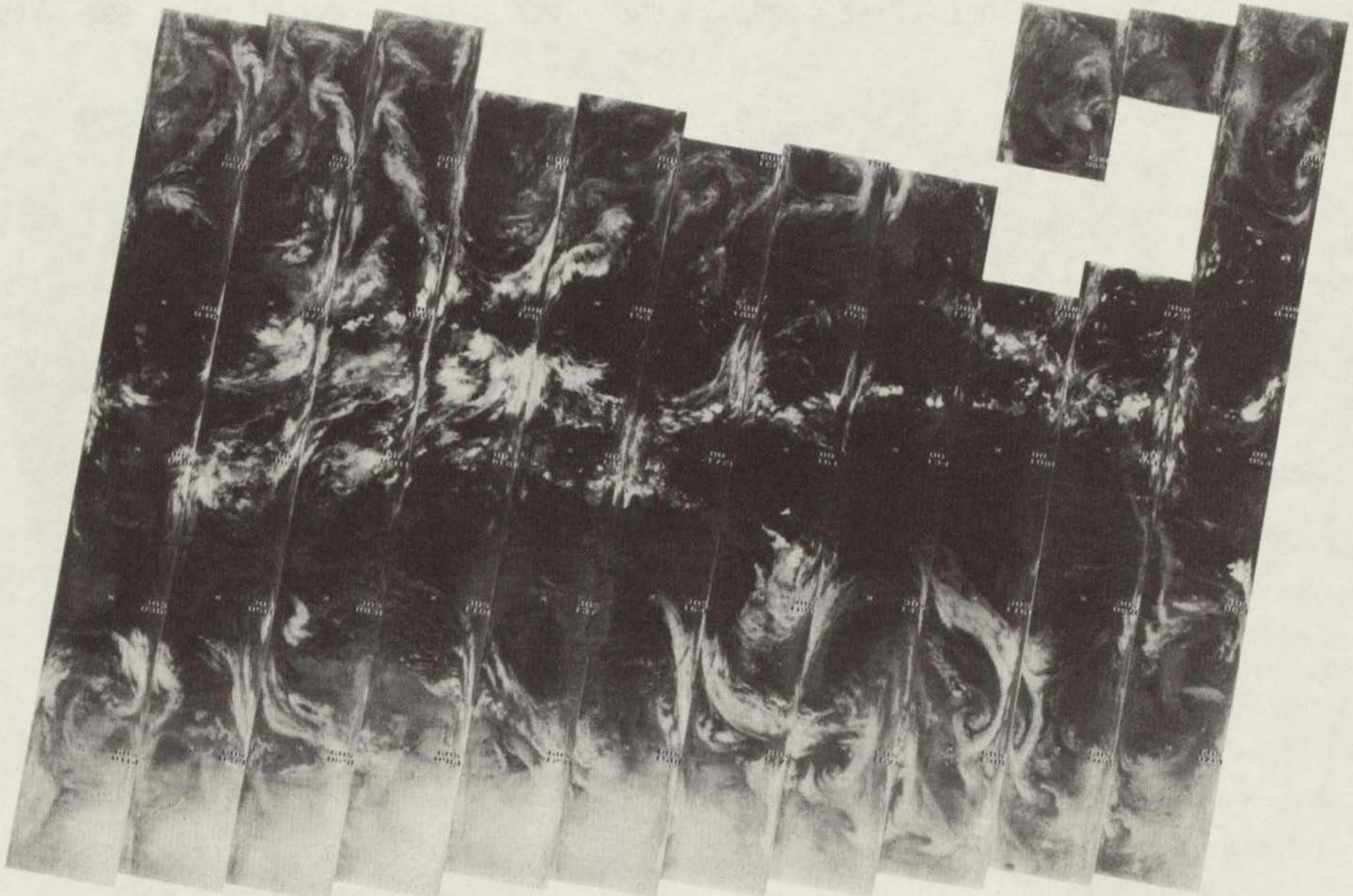
11.5 μm



747 746 745 744 743 742 741 740 739 738 737 736 735 734

6 AUGUST 1975

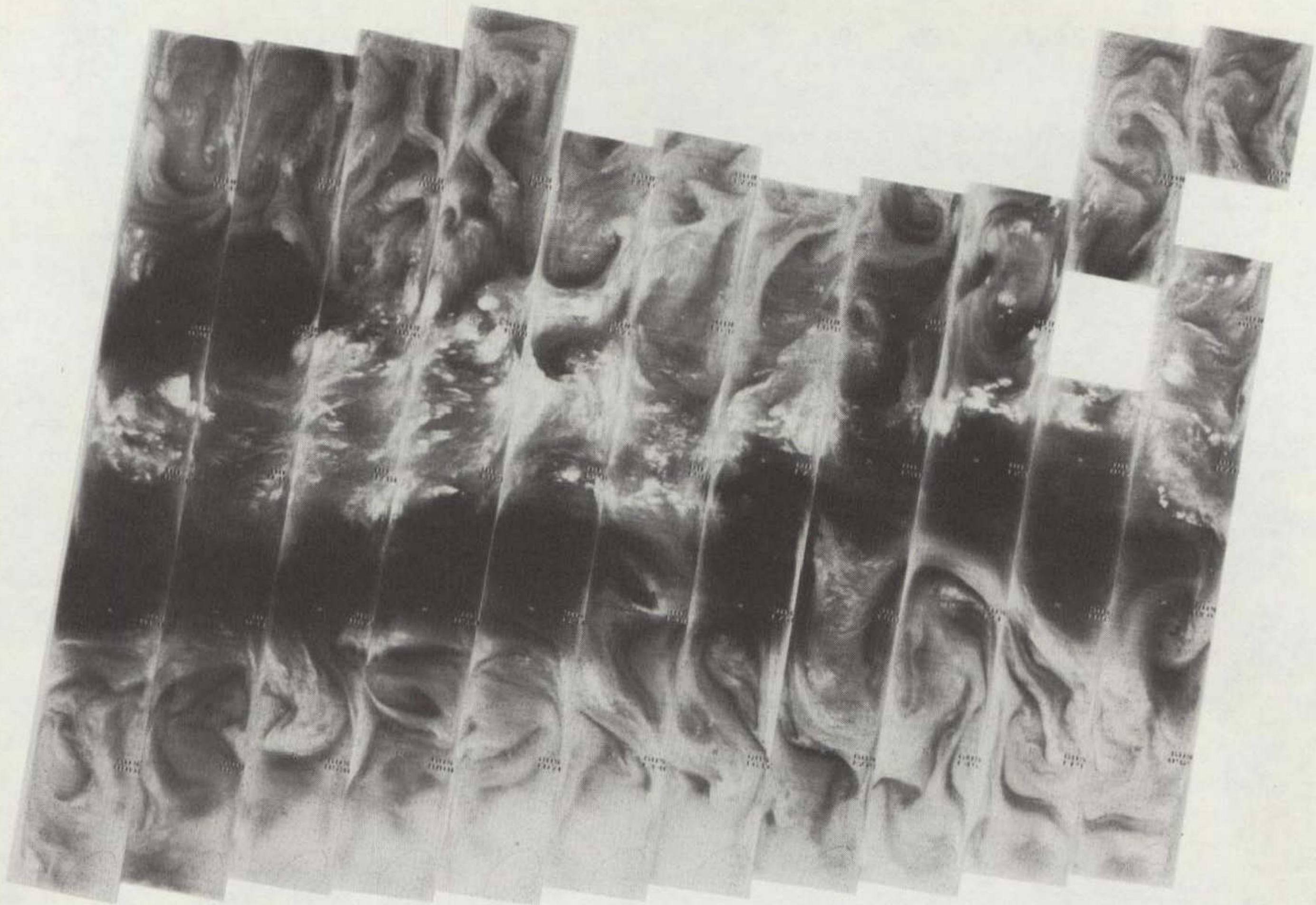
6.7 μm



747 746 745 744 743 742 741 740 739 738 737 736 735 734

6 AUGUST 1975

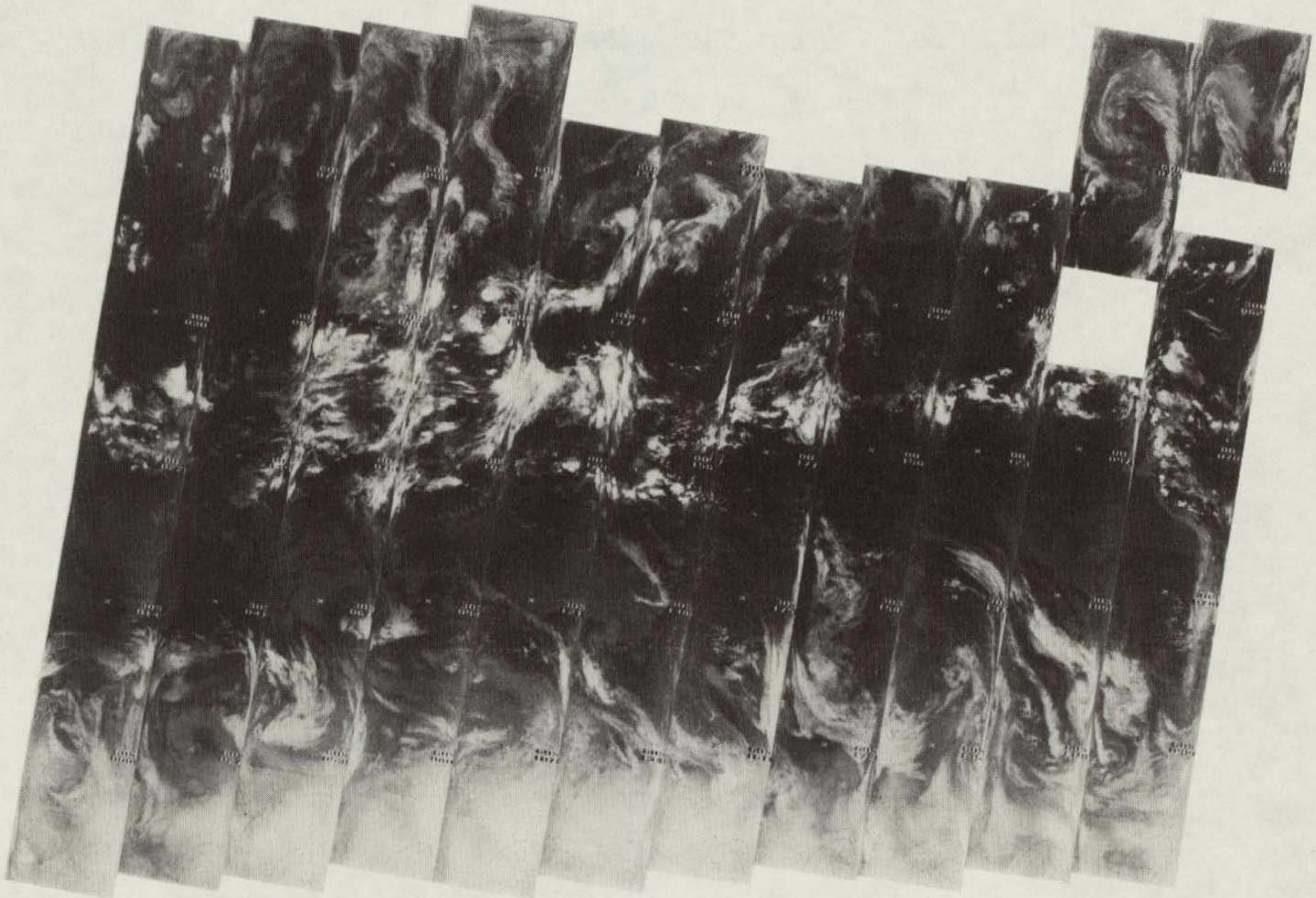
11.5 μm



760 759 758 757 756 755 754 753 752 751 750 749 748

7 AUGUST 1975

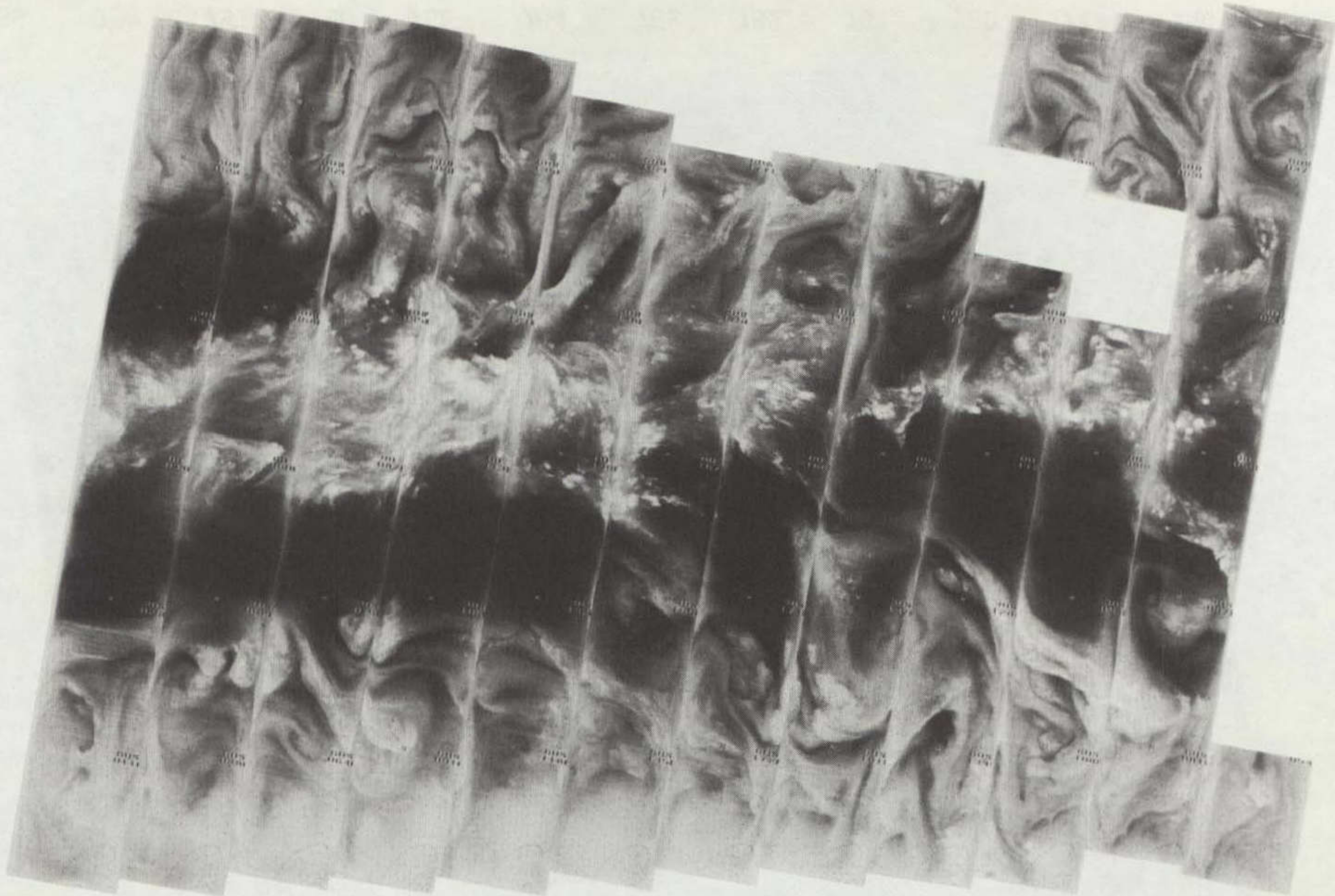
6.7 μm



760 759 758 757 756 755 754 753 752 751 750 749 748

7 AUGUST 1975

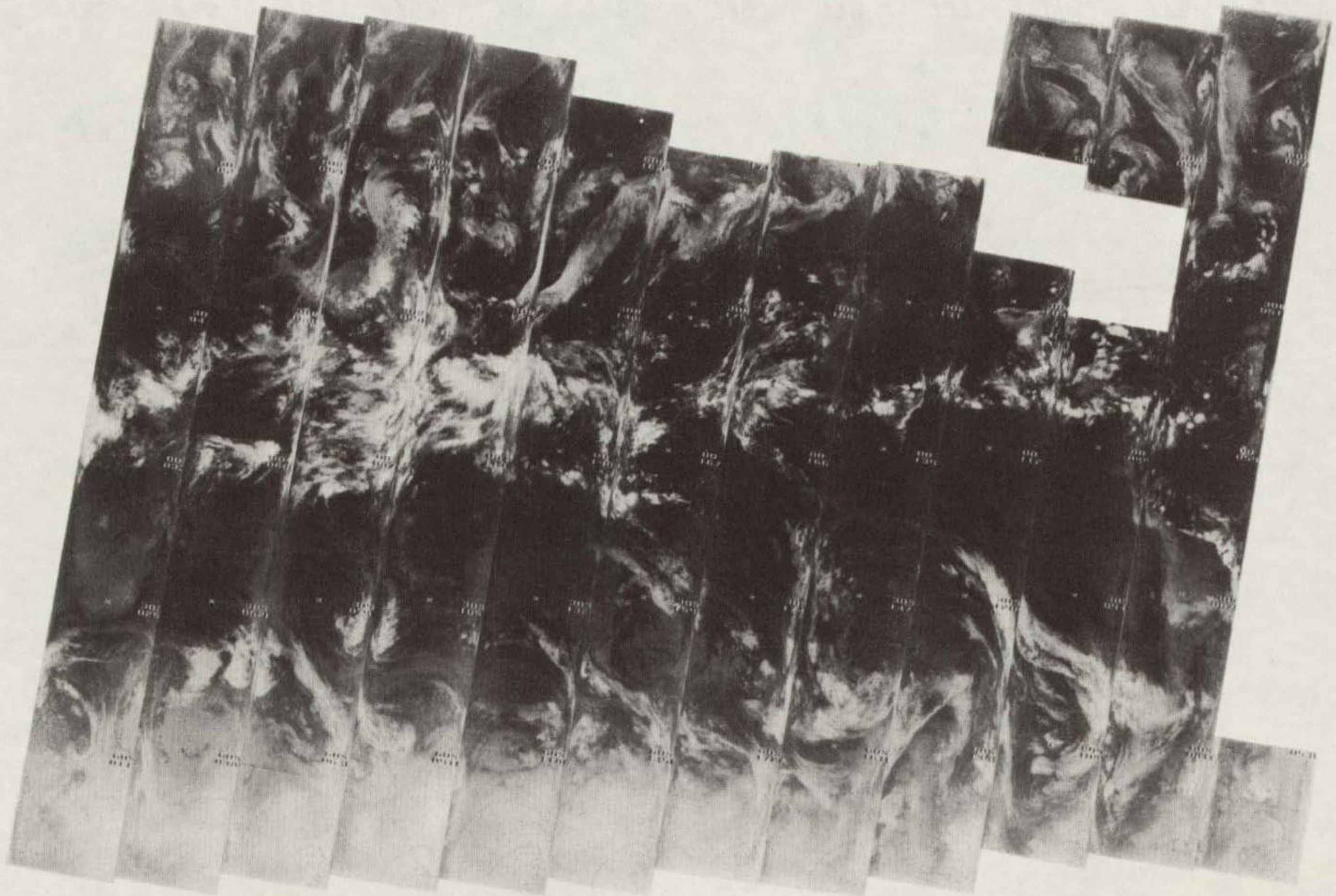
11.5 μm



773 772 771 770 769 768 767 766 765 764 763 762 761

8 AUGUST 1975

6.7 μm



773 772 771 770 769 768 767 766 765 764 763 762 761

8 AUGUST 1975

11.5 μm

787 786 785 784 783 782 781 780 779 778 777 776 775 774

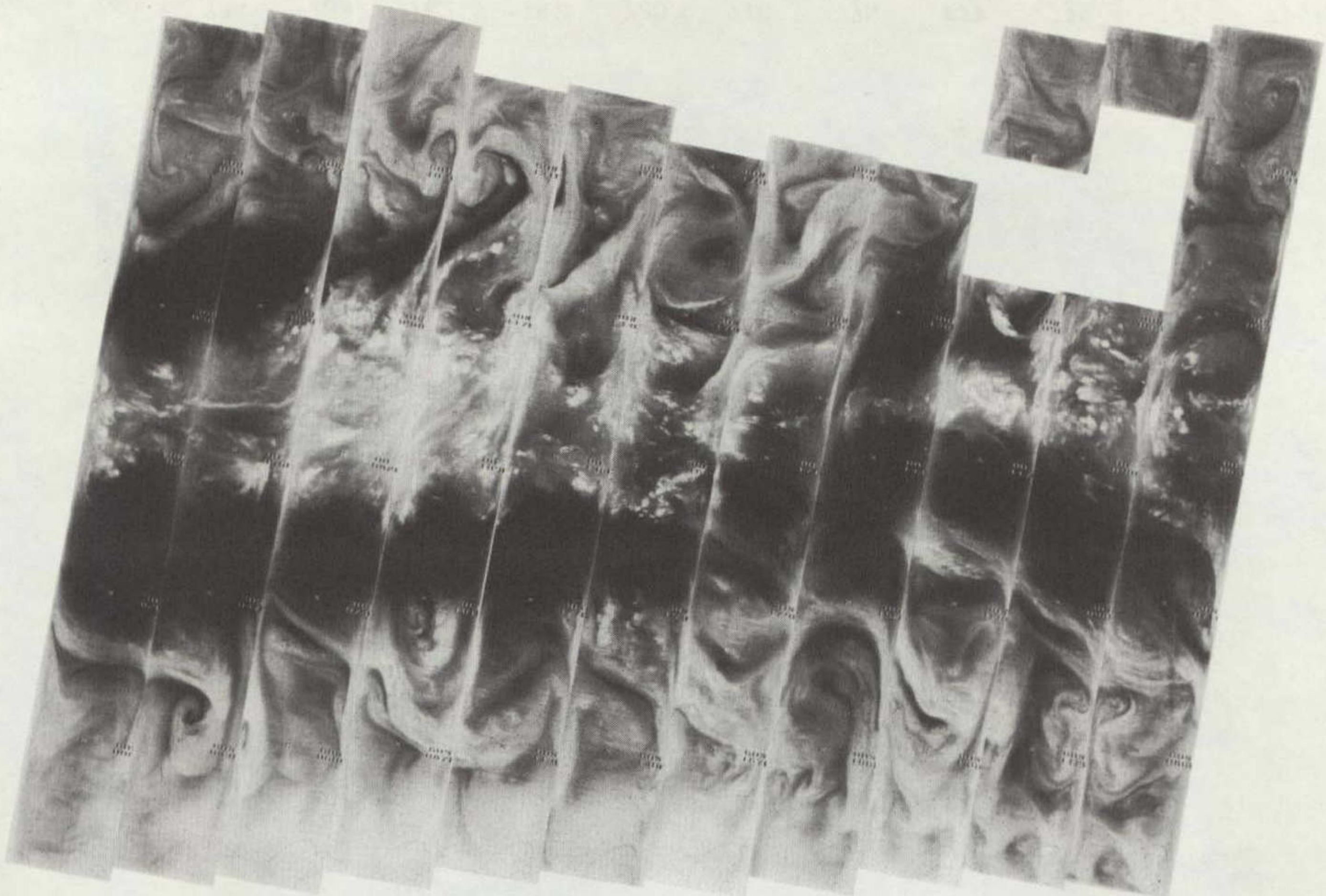
9 AUGUST 1975

6.7 μm

787 786 785 784 783 782 781 780 779 778 777 776 775 774

9 AUGUST 1975

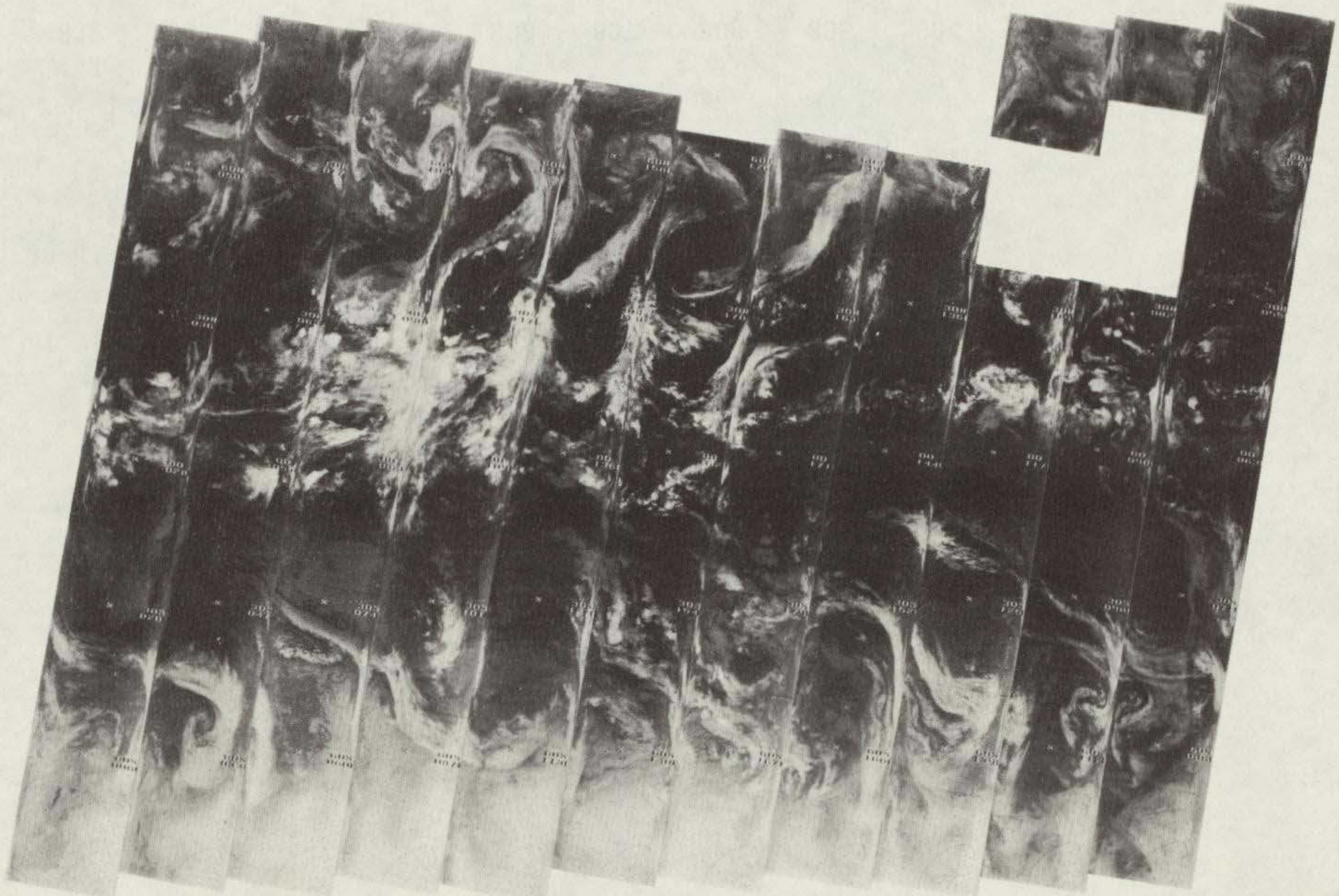
11.5 μm



800 799 798 797 796 795 794 793 792 791 790 789 788

10 AUGUST 1975

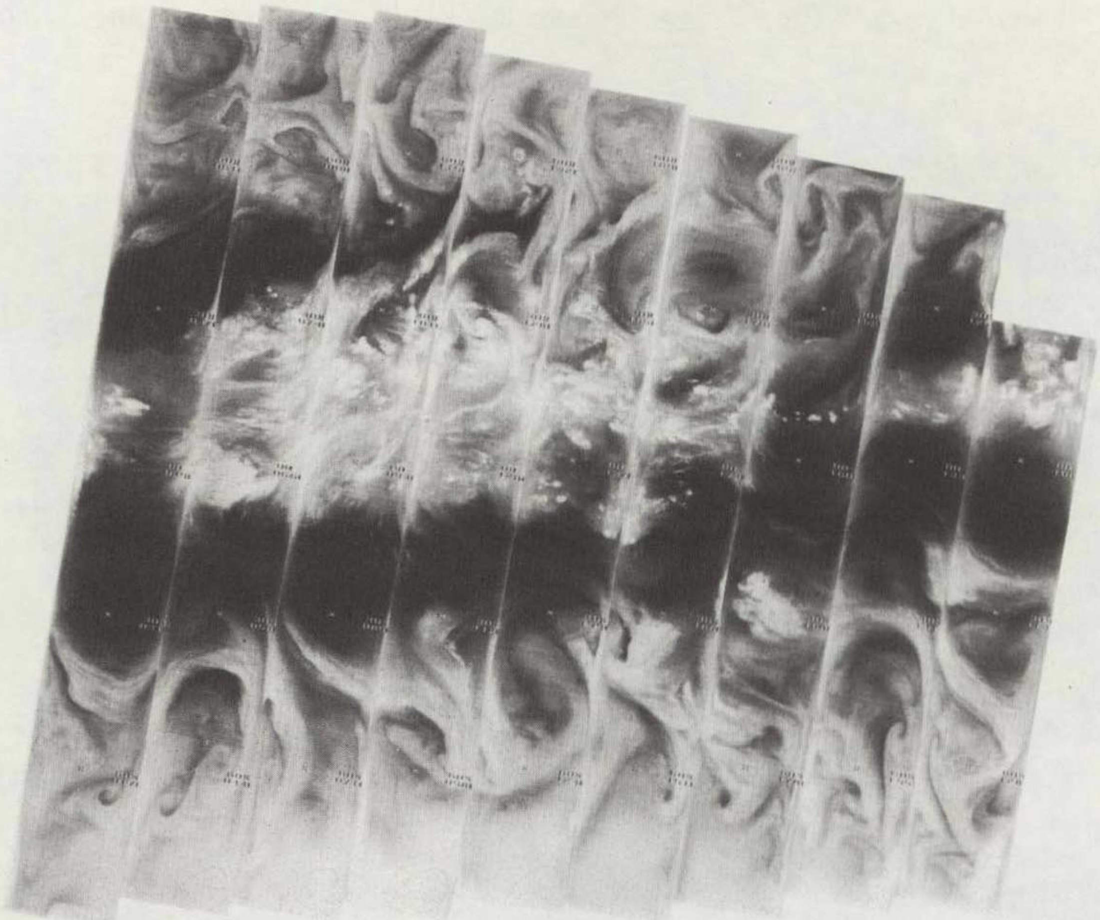
6.7 μm



800 799 798 797 796 795 794 793 792 791 790 789 788

10 AUGUST 1975

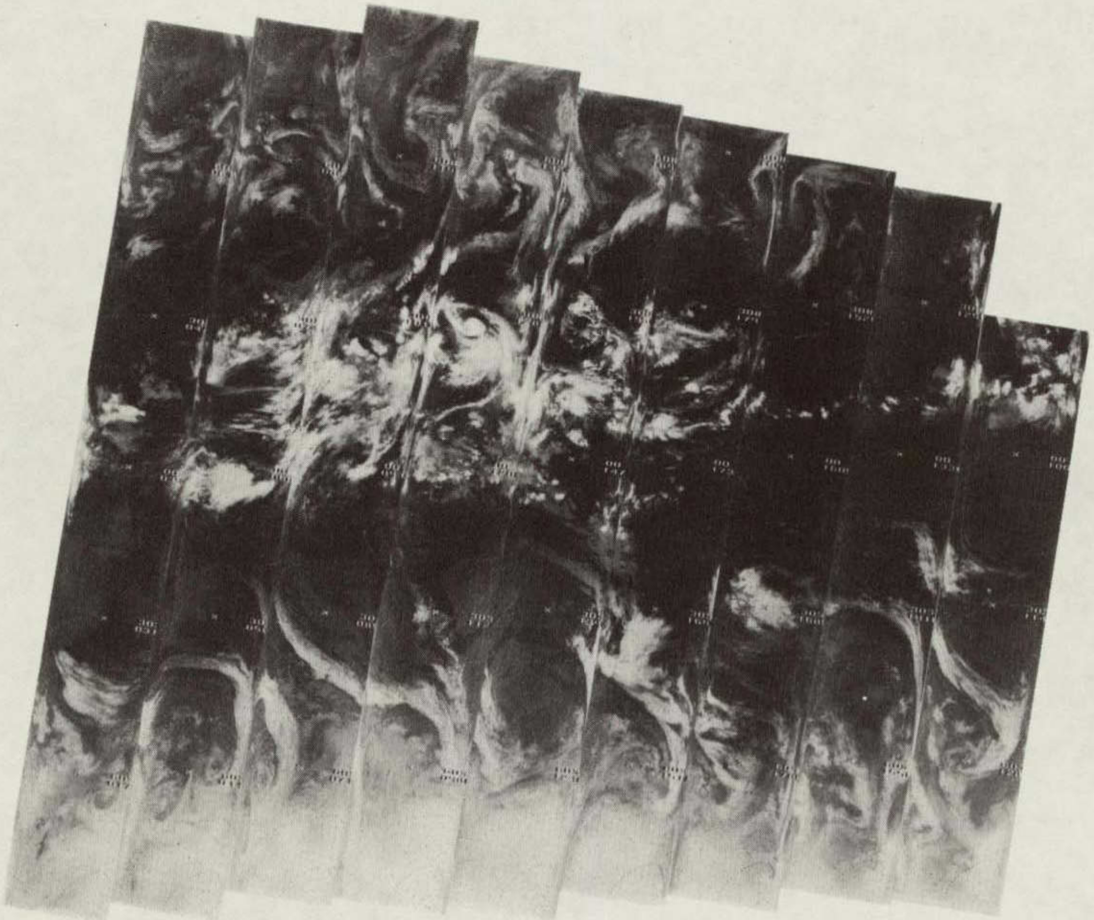
11.5 μm



814 813 812 811 810 809 808 807 806 805 804 803 802 801

11 AUGUST 1975

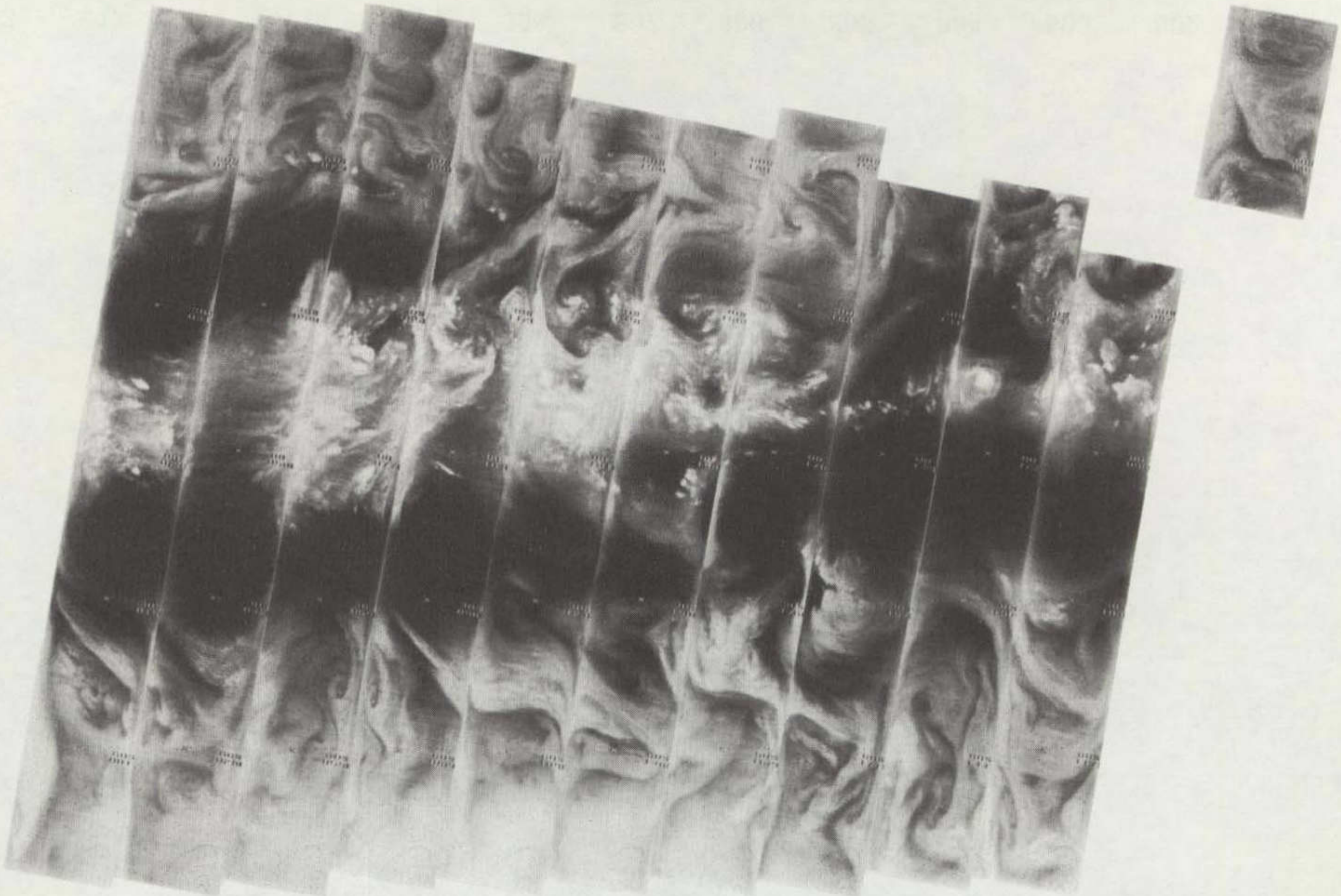
6.7 μm



814 813 812 811 810 809 808 807 806 805 804 803 802 801

11 AUGUST 1975

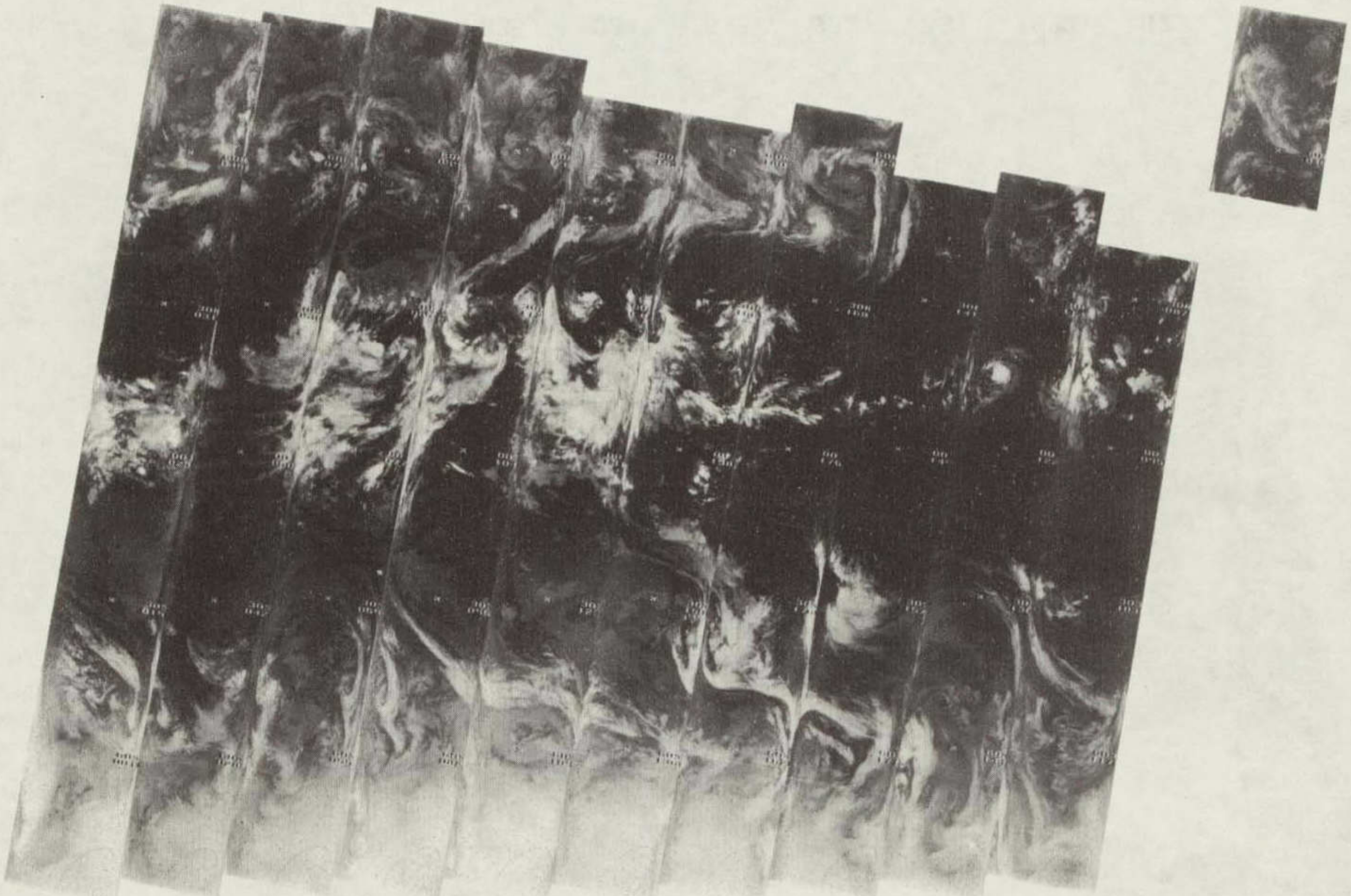
11.5 μm



827 826 825 824 823 822 821 820 819 818 817 816 815

12 AUGUST 1975

6.7 μm



827 826 825 824 823 822 821 820 819 818 817 816 815

12 AUGUST 1975

11.5 μm

840 839 838 837 836 835 834 833 832 831 830 829 828

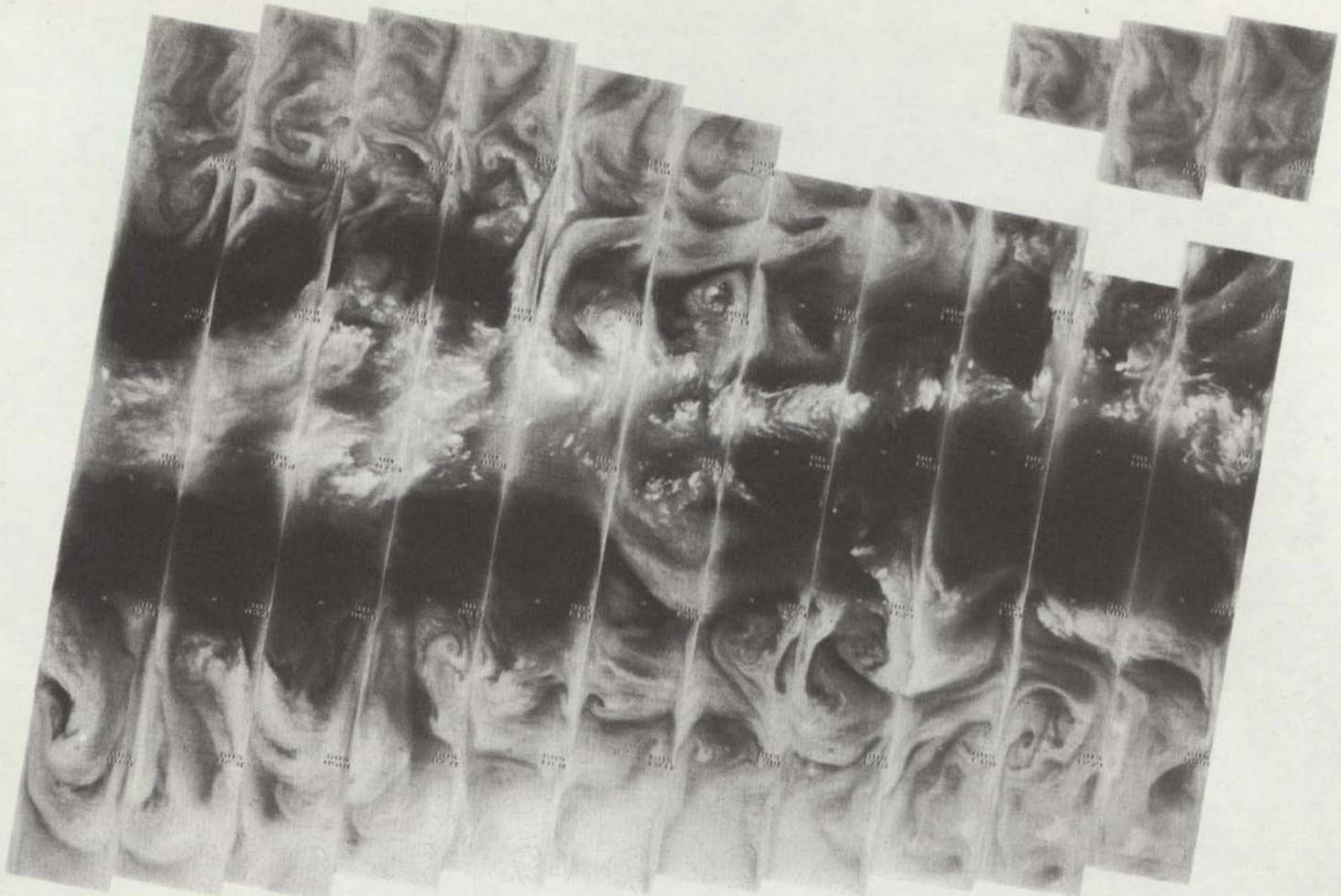
13 AUGUST 1975

6.7 μm

840 839 838 837 836 835 834 833 832 831 830 829 828

13 AUGUST 1975

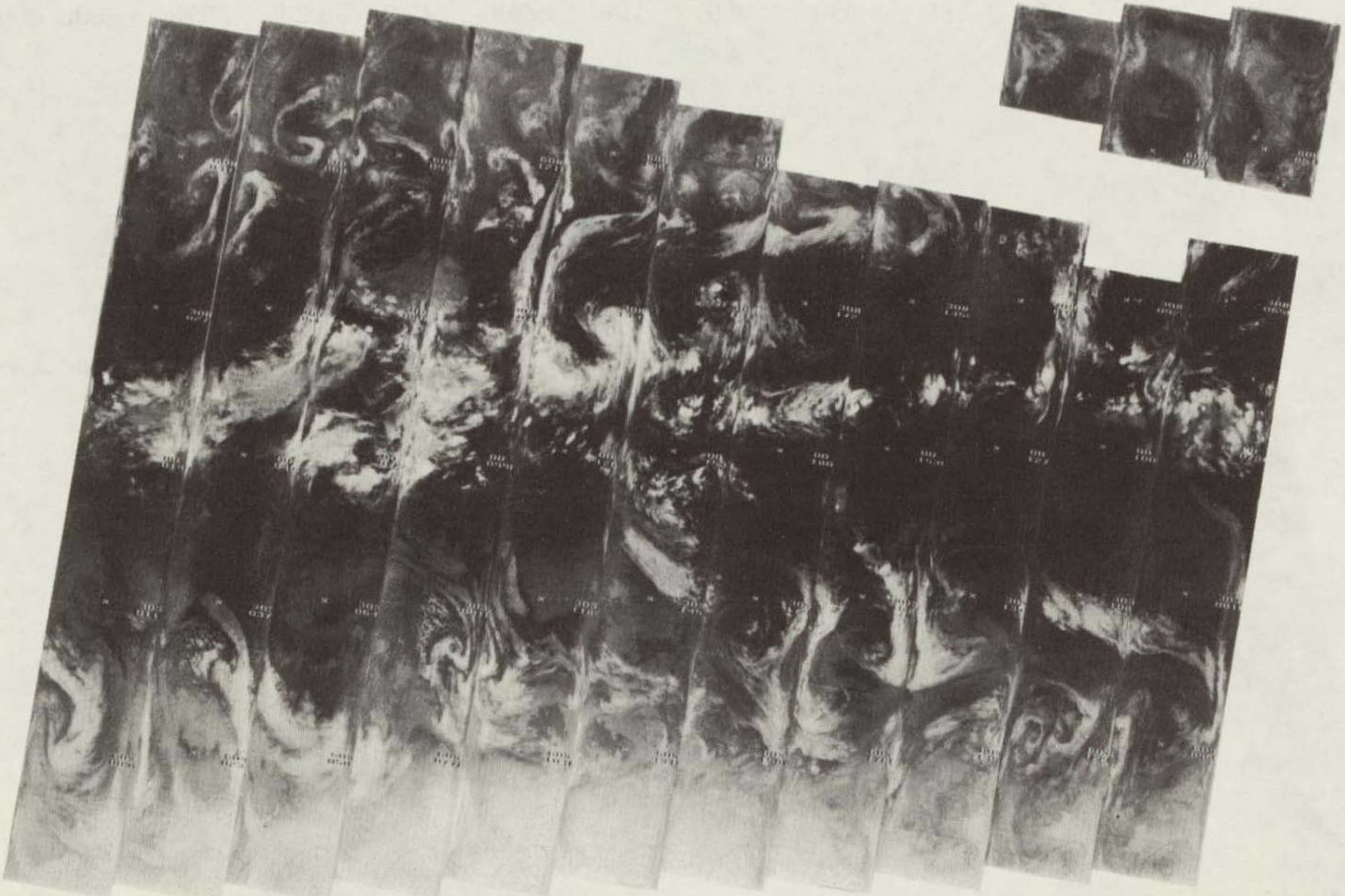
11.5μm



854 853 852 851 850 849 848 847 846 845 844 843 842 841

14 AUGUST 1975

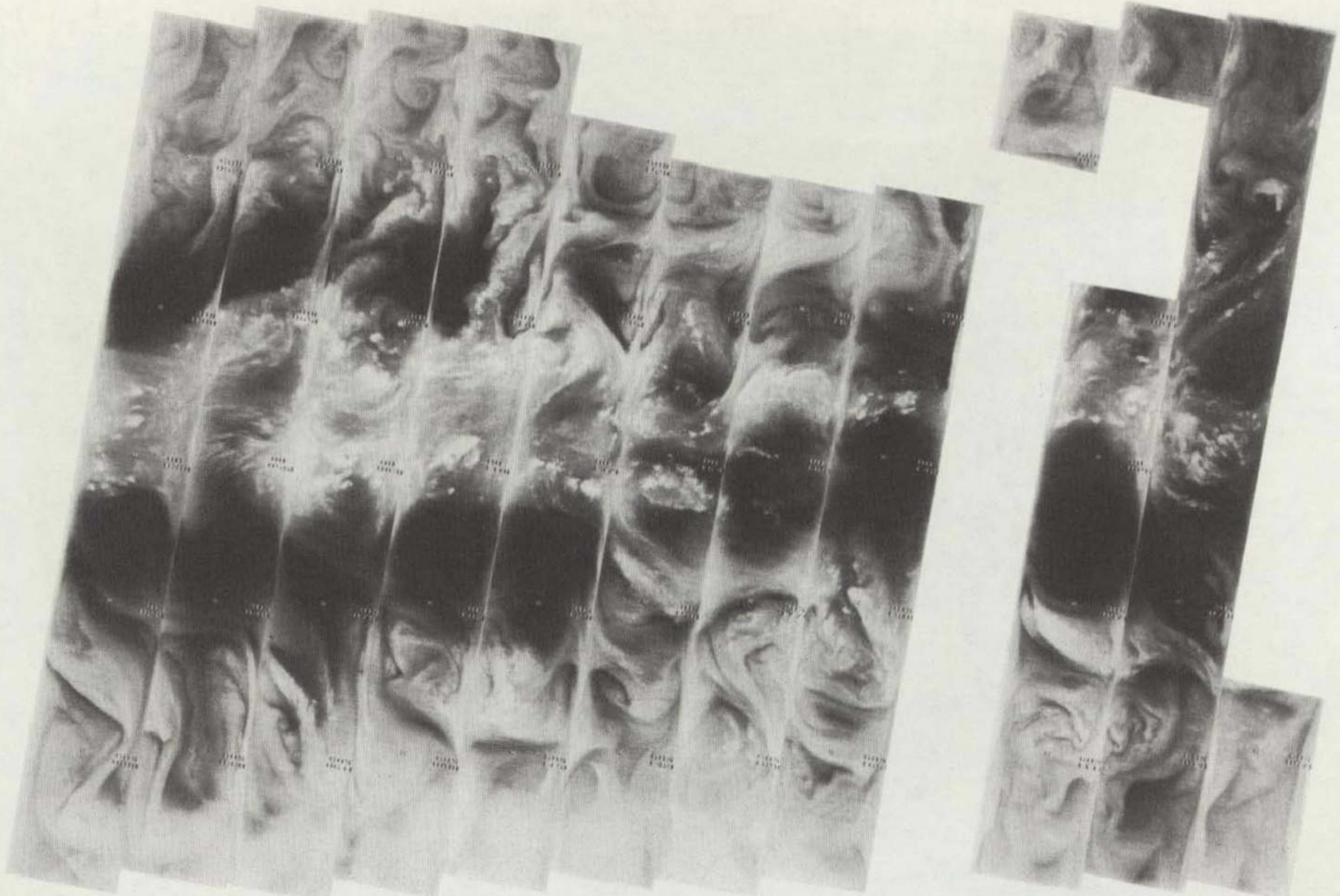
6.7 μm



854 853 852 851 850 849 848 847 846 845 844 843 842 841

14 AUGUST 1975

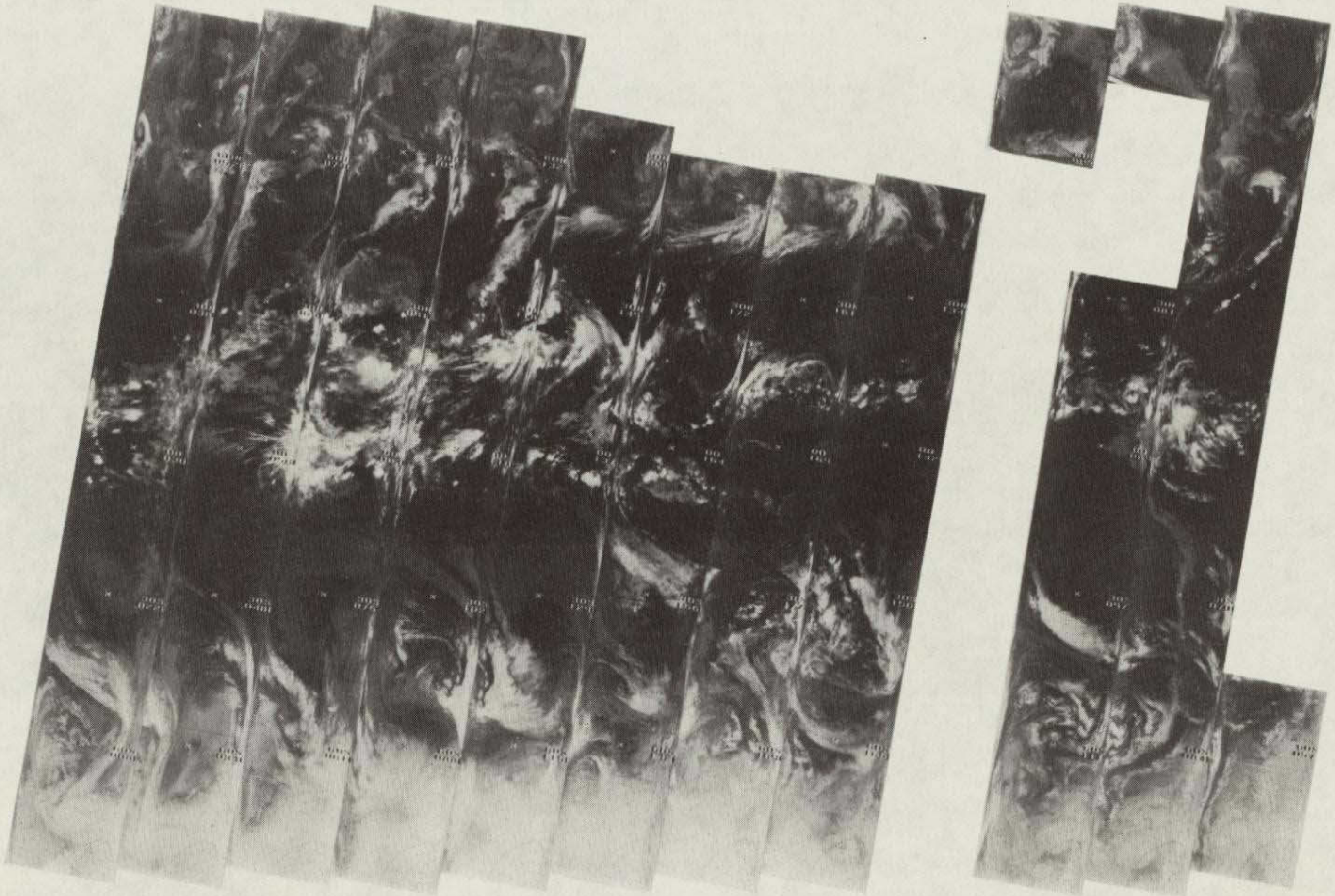
11.5 μm



867 866 865 864 863 862 861 860 859 858 857 856 855

15 AUGUST 1975

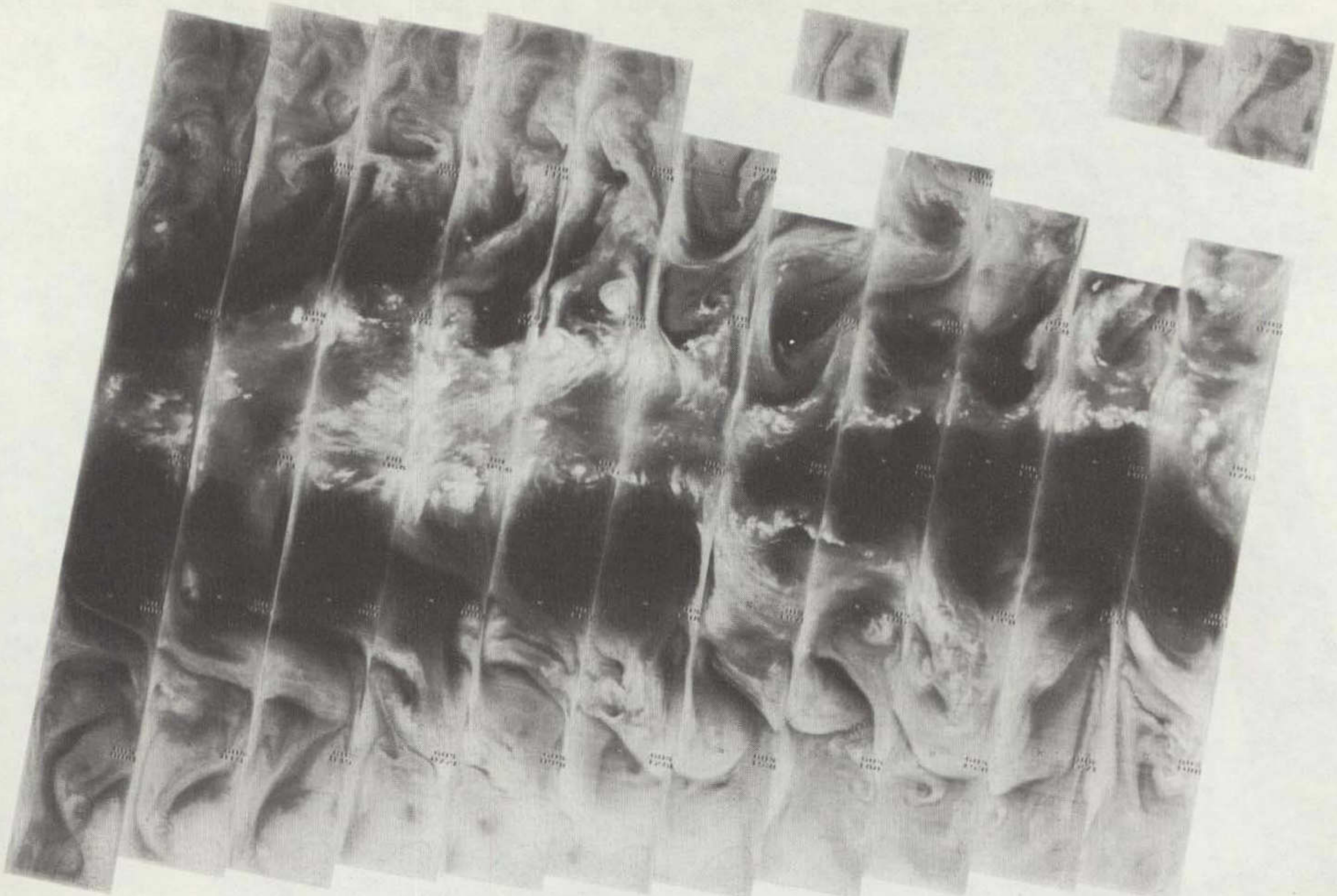
6.7 μm



867 866 865 864 863 862 861 860 859 858 857 856 855

15 AUGUST 1975

11.5 μm



881 880 879 878 877 876 875 874 873 872 871 870 869 868

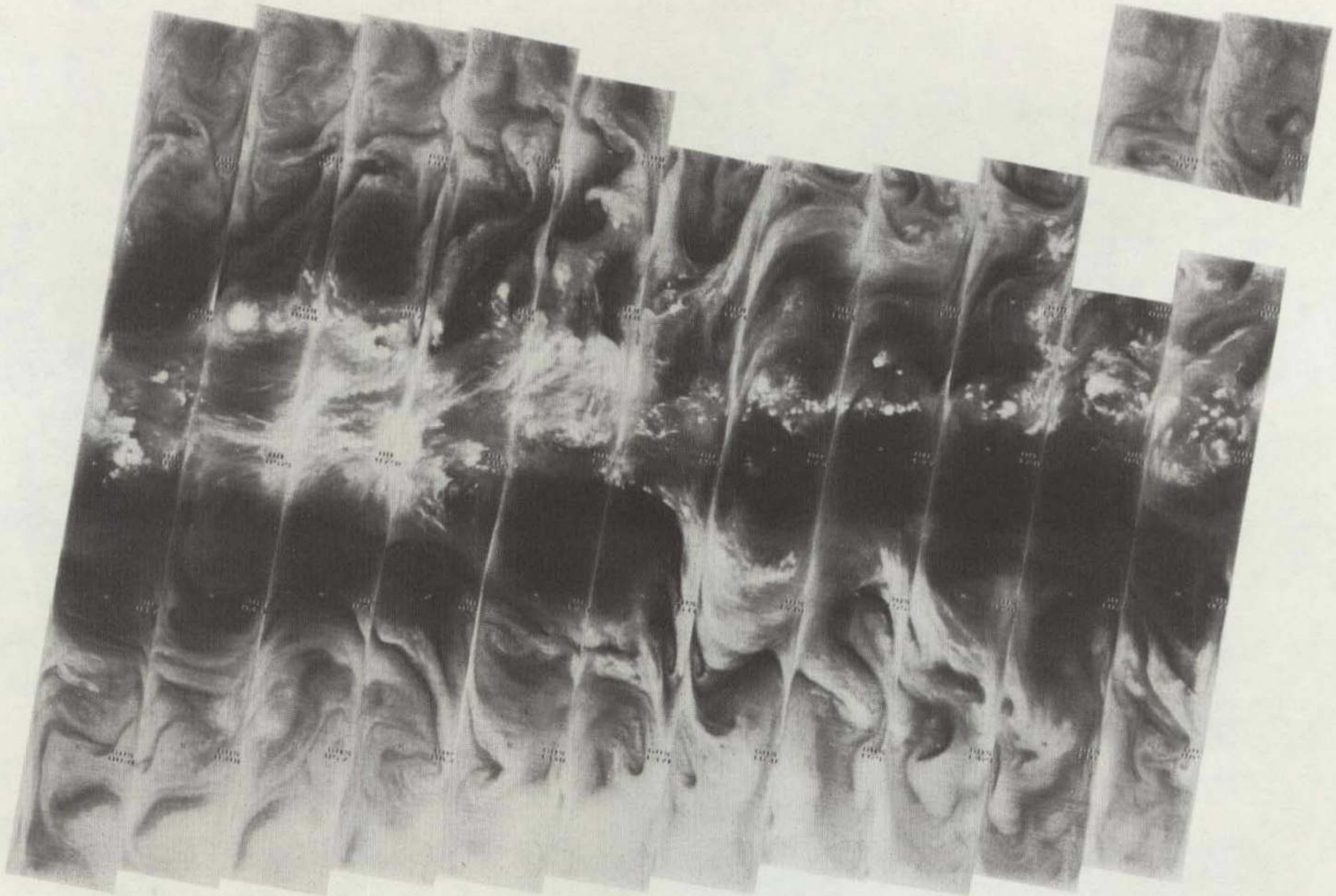
16 AUGUST 1975

6.7 μm

881 880 879 878 877 876 875 874 873 872 871 870 869 868

16 AUGUST 1975

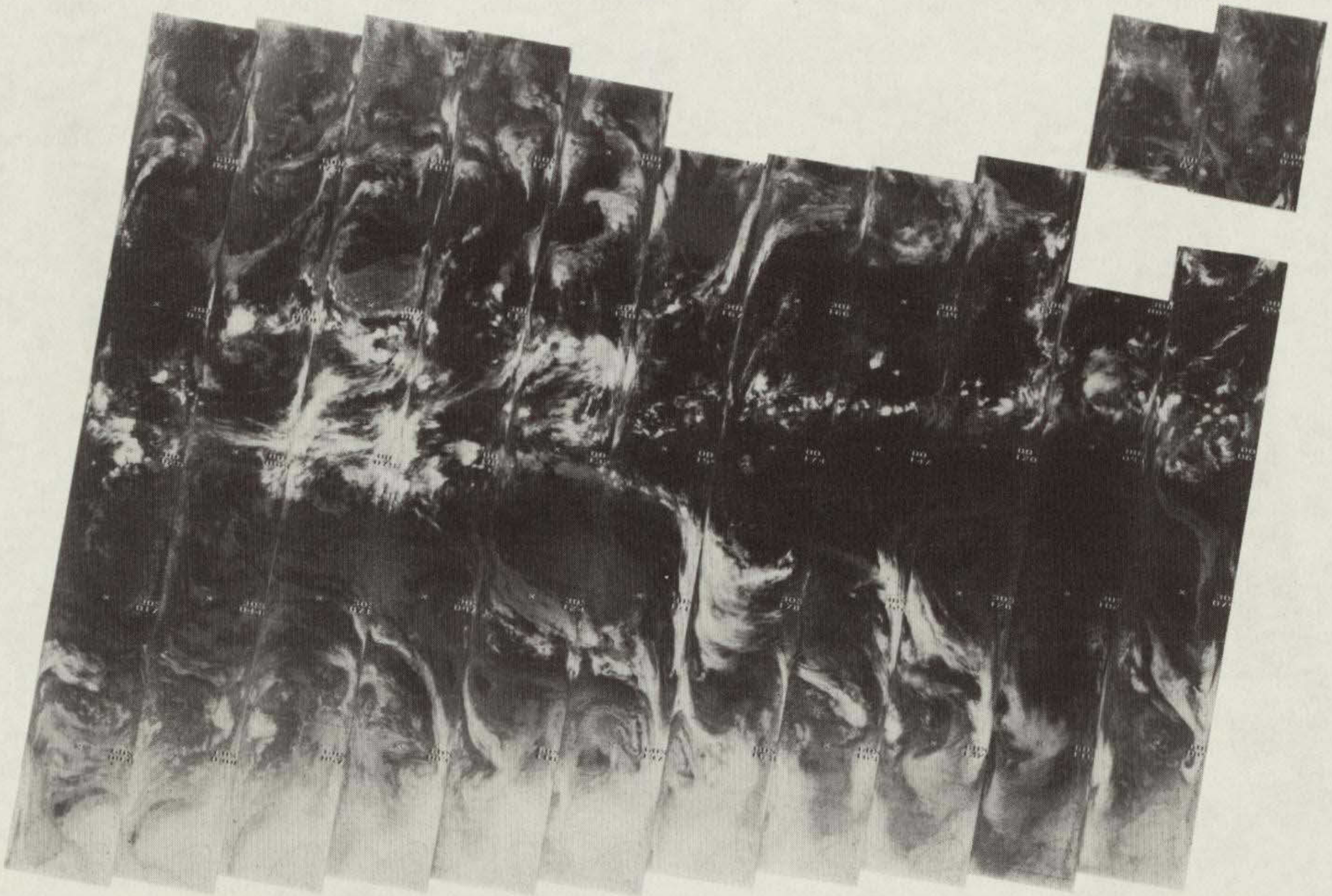
11.5 μm



894 893 892 891 890 889 888 887 886 885 884 883 882

17 AUGUST 1975

6.7 μm



894 893 892 891 890 889 888 887 886 885 884 883 882

17 AUGUST 1975

11.5 μm

907 906 905 904 903 902 901 900 899 898 897 896 895

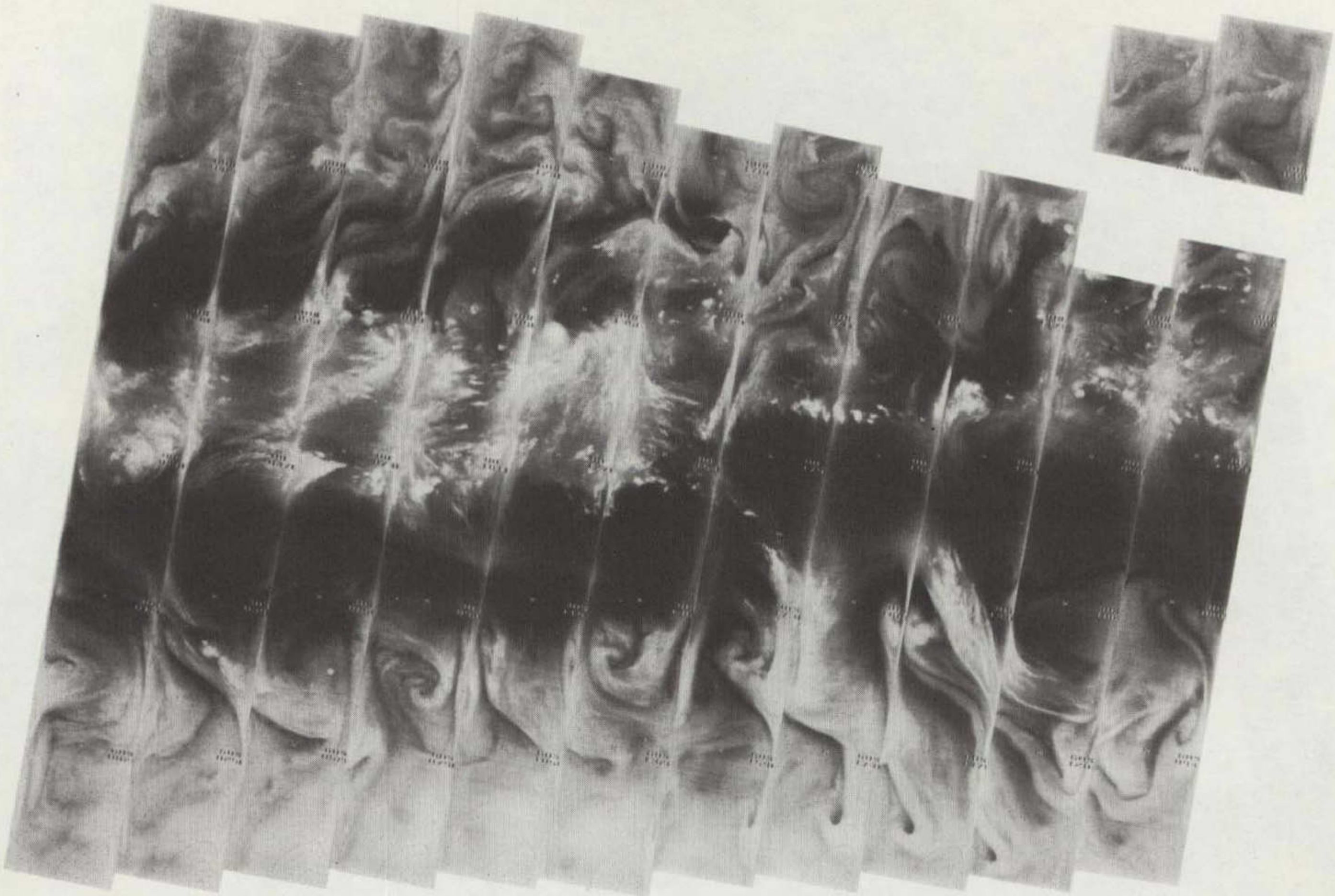
18 AUGUST 1975

6.7 μm

907 906 905 904 903 902 901 900 899 898 897 896 895

18 AUGUST 1975

11.5 μm



921 920 919 918 917 916 915 914 913 912 911 910 909 908

19 AUGUST 1975

6.7 μm

921 920 919 918 917 916 915 914 913 912 911 910 909 908

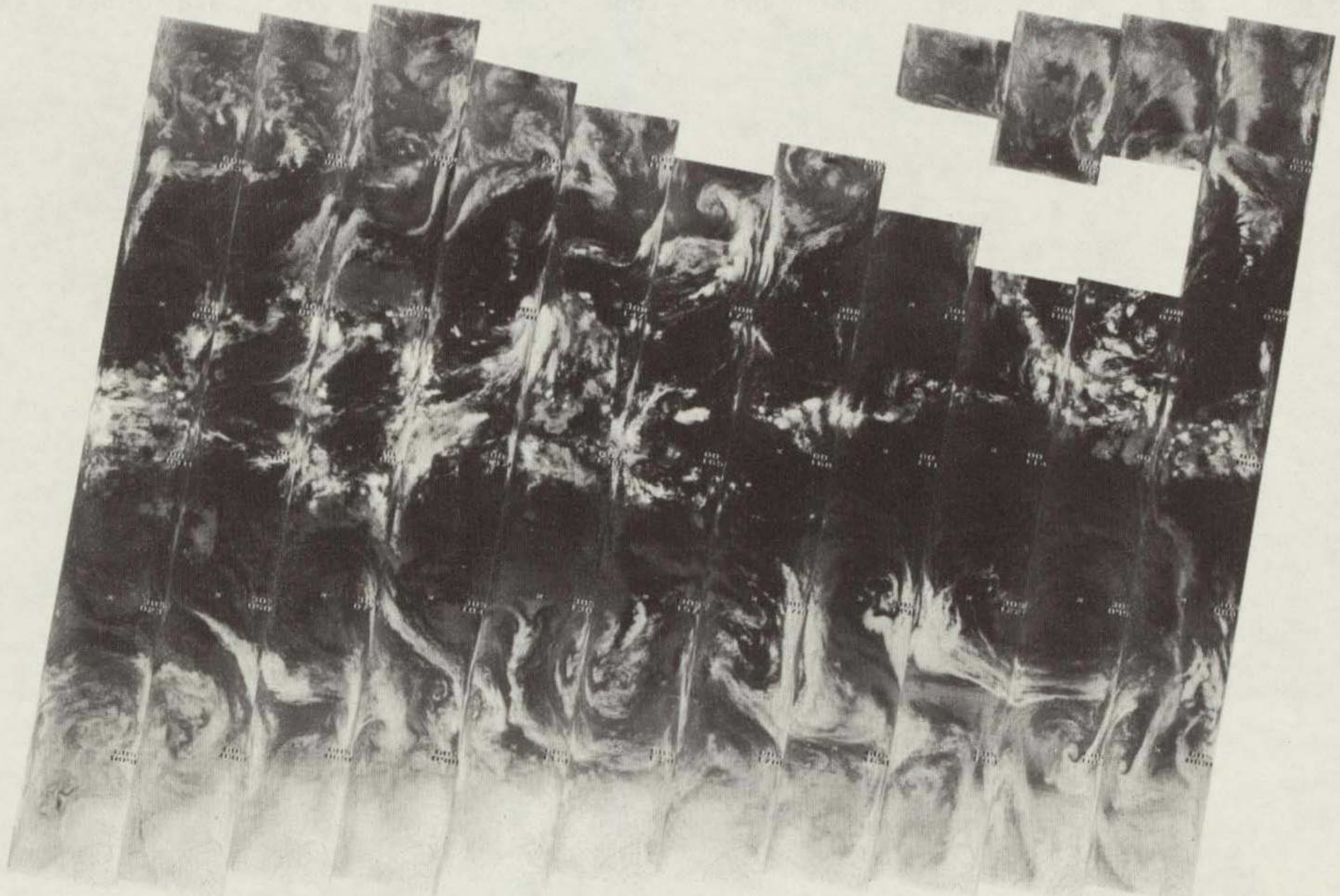
19 AUGUST 1975

11.5 μm

934 933 932 931 930 929 928 927 926 925 924 923 922

20 AUGUST 1975

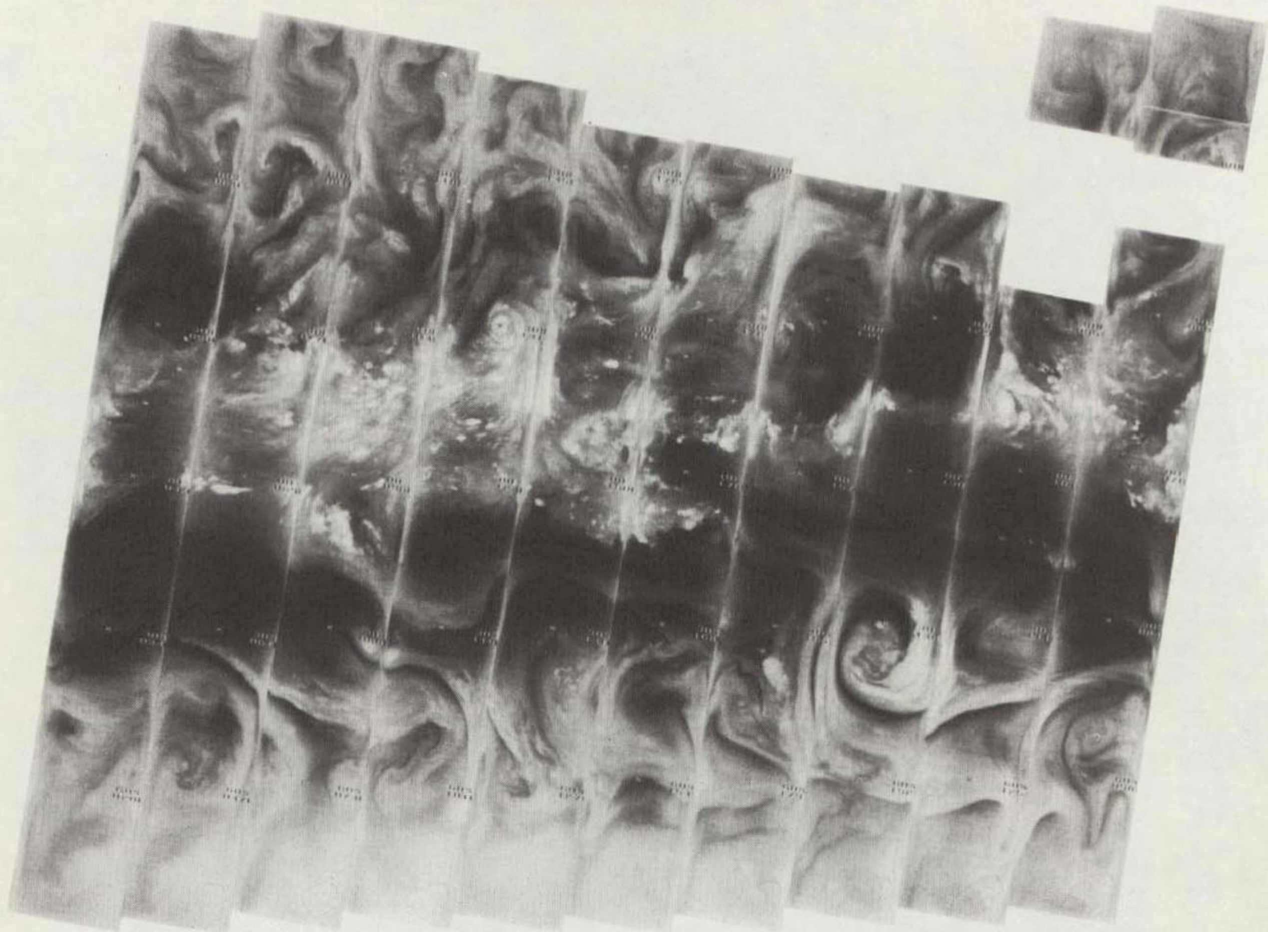
6.7 μm



934 933 932 931 930 929 928 927 926 925 924 923 922

20 AUGUST 1975

11.5 μm



948 947 946 945 944 943 942 941 940 939 938 937 936 935

21 AUGUST 1975

6.7 μm

948 947 946 945 944 943 942 941 940 939 938 937 936 935

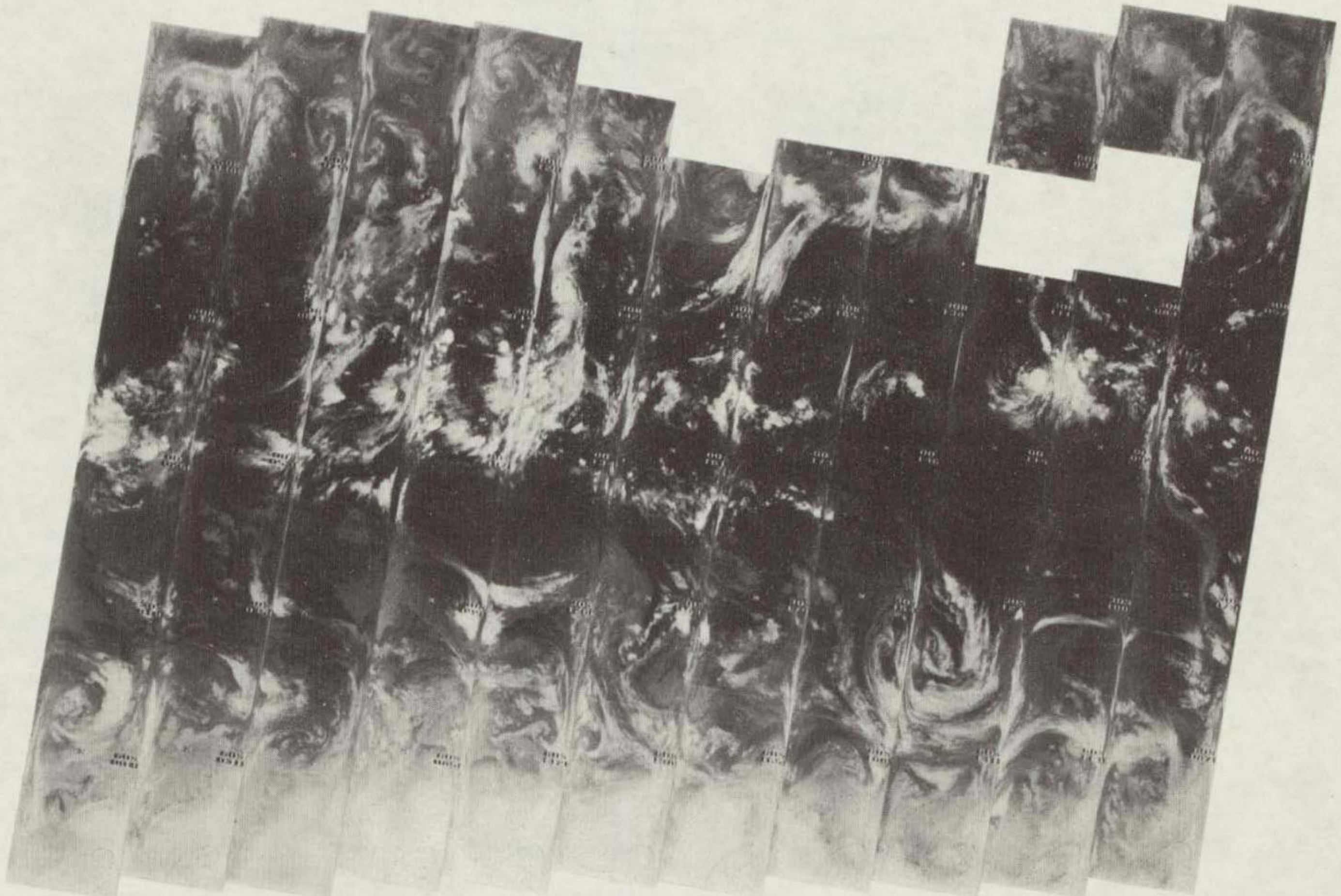
21 AUGUST 1975

11.5 μm

961 960 959 958 957 956 955 954 953 952 951 950 949

22 AUGUST 1975

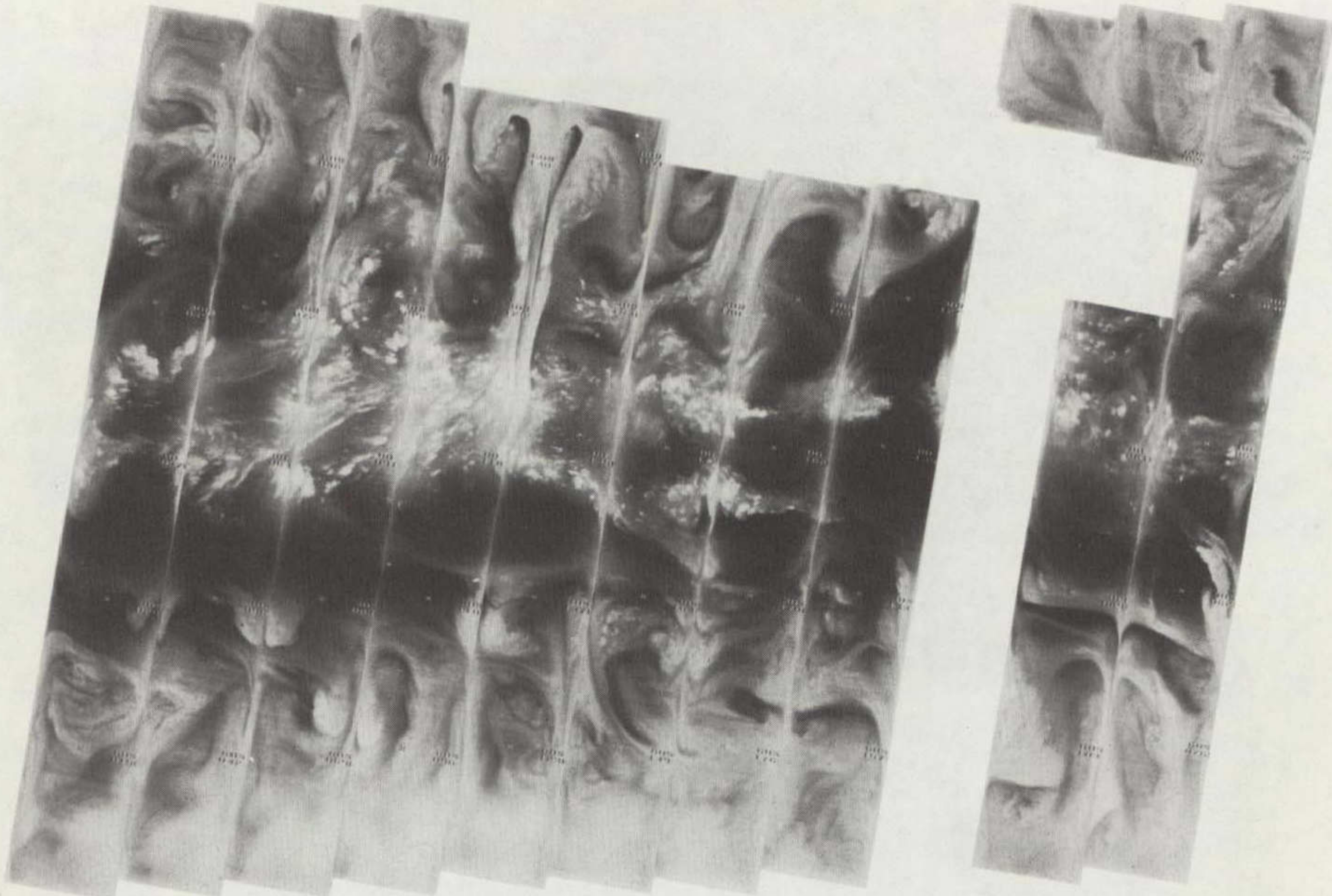
6.7 μm



961 960 959 958 957 956 955 954 953 952 951 950 949

22 AUGUST 1975

11.5 μm



975 974 973 972 971 970 969 968 967 966 965 964 963 962

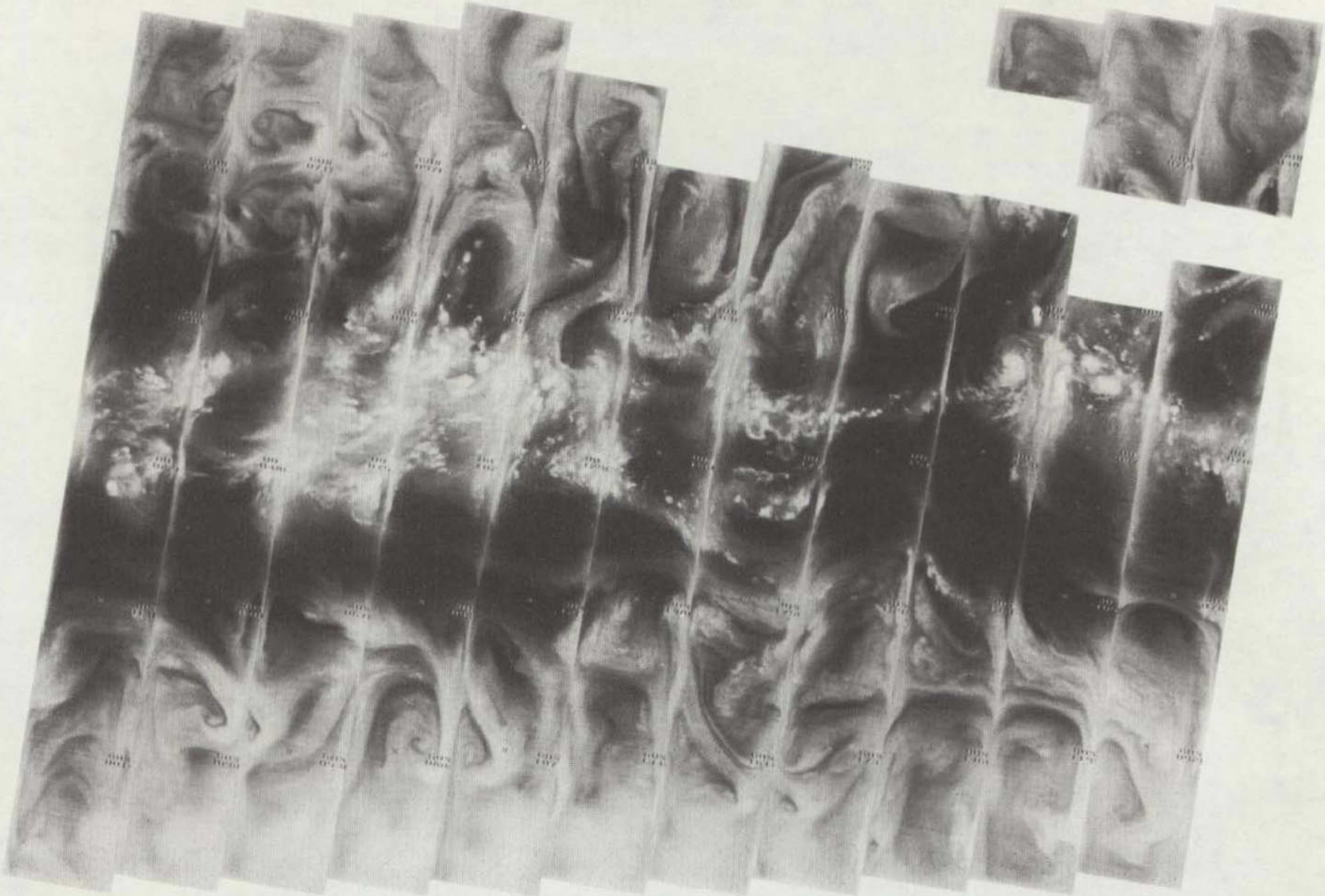
23 AUGUST 1975

6.7 μm

975 974 973 972 971 970 969 968 967 966 965 964 963 962

23 AUGUST 1975

11.5 μm



988 987 986 985 984 983 982 981 980 979 978 977 976

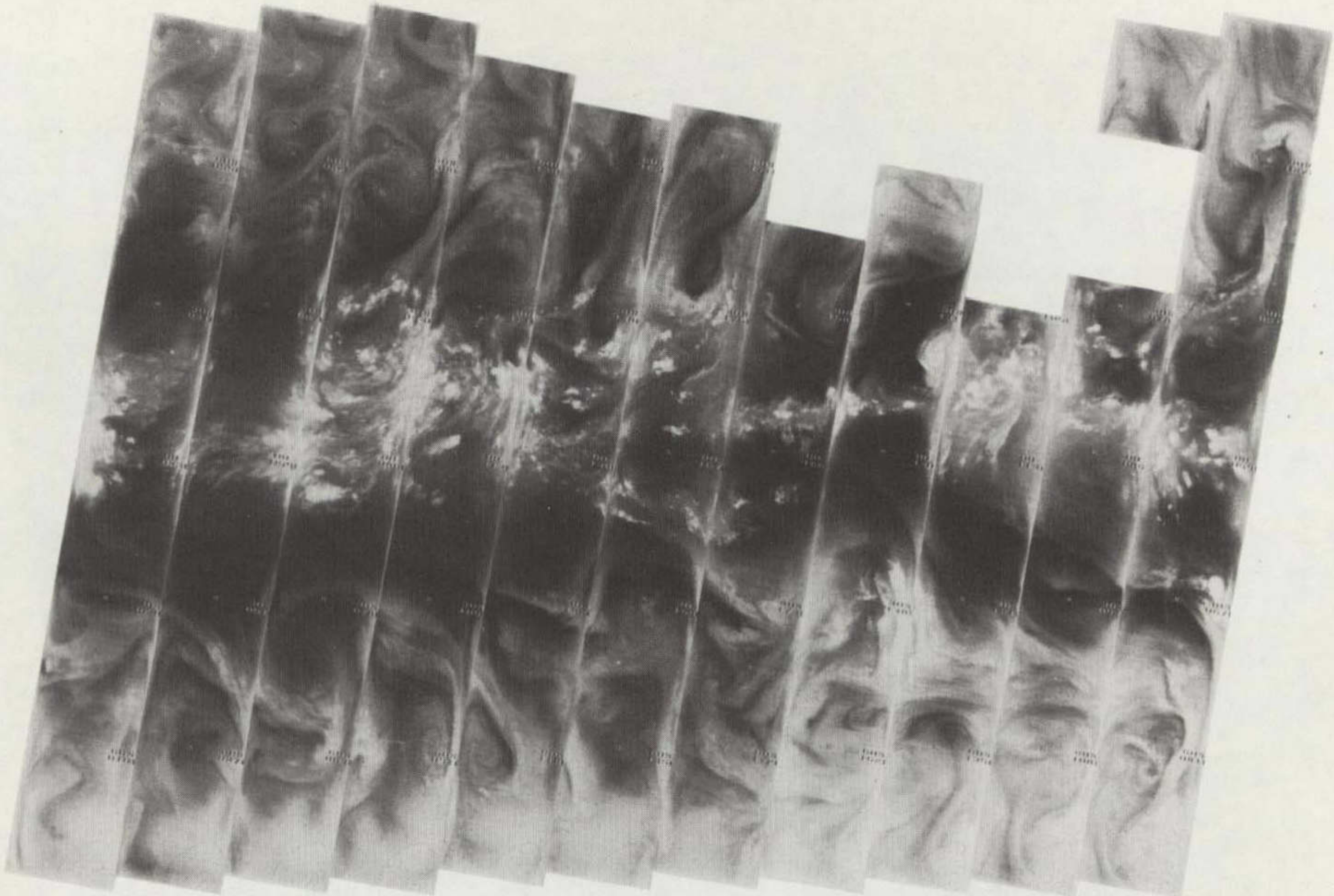
24 AUGUST 1975

6.7 μm

988 987 986 985 984 983 982 981 980 979 978 977 976

24 AUGUST 1975

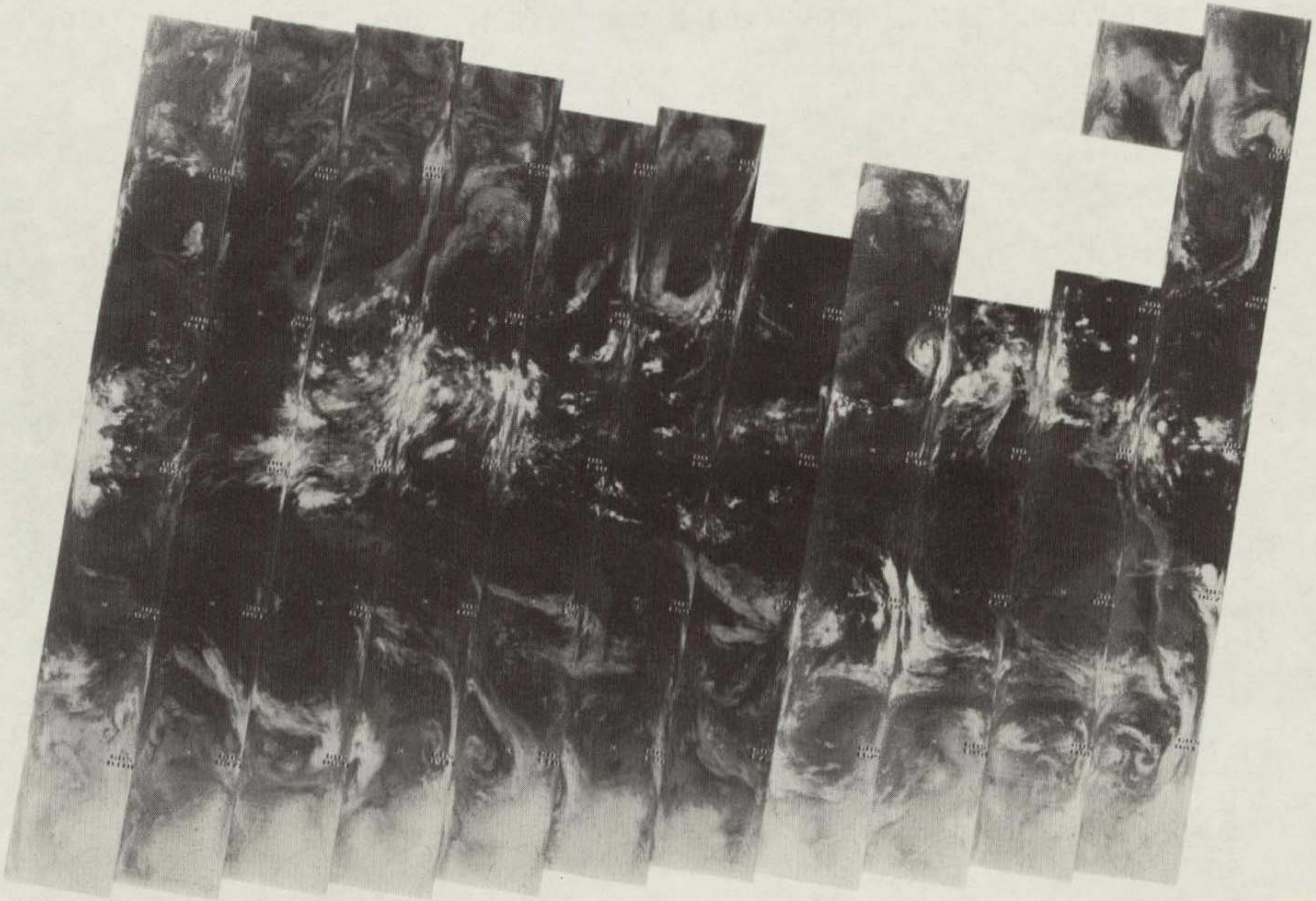
11.5 μm



1001 1000 999 998 997 996 995 994 993 992 991 990 989

25 AUGUST 1975

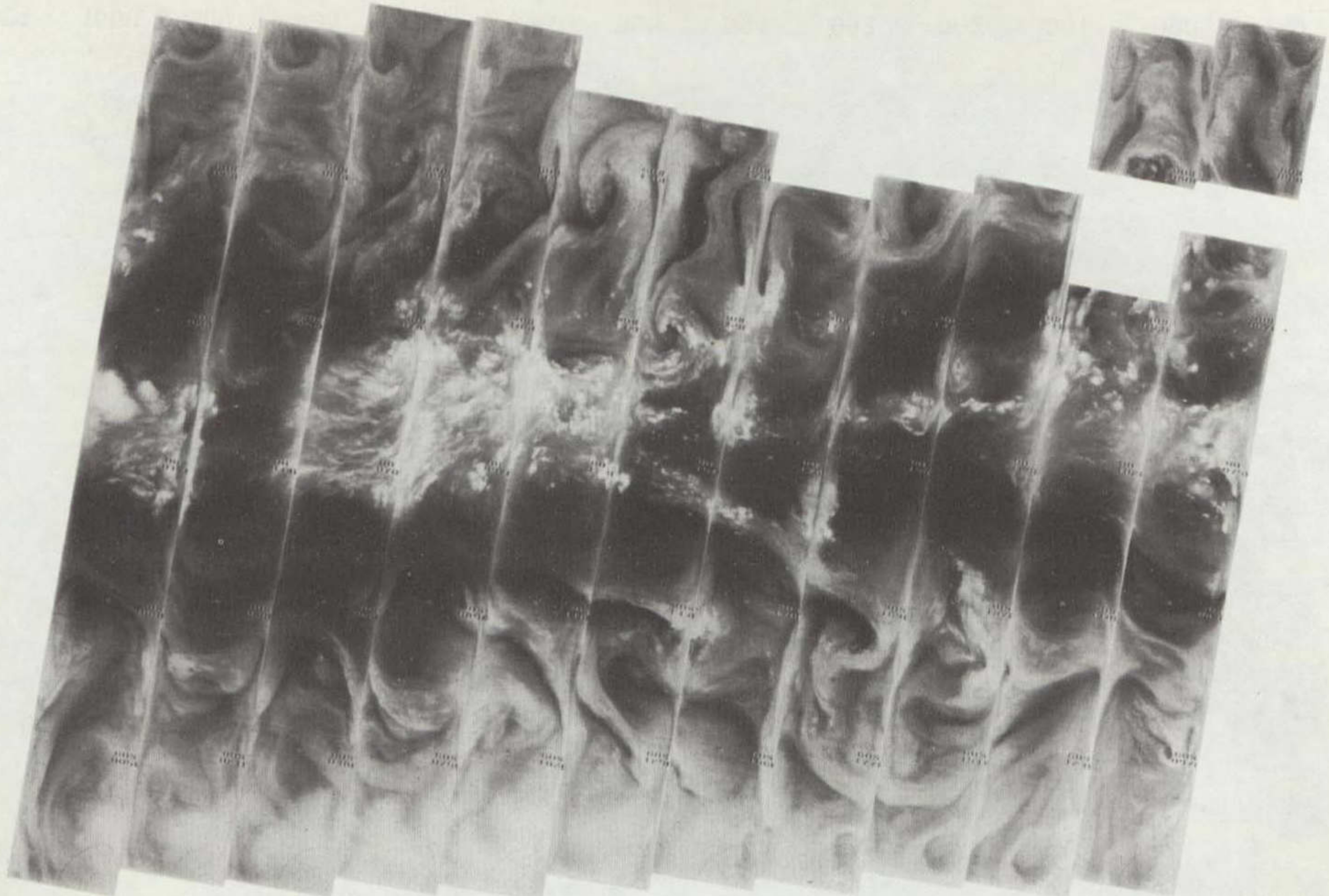
6.7 μm



1001 1000 999 998 997 996 995 994 993 992 991 990 989

25 AUGUST 1975

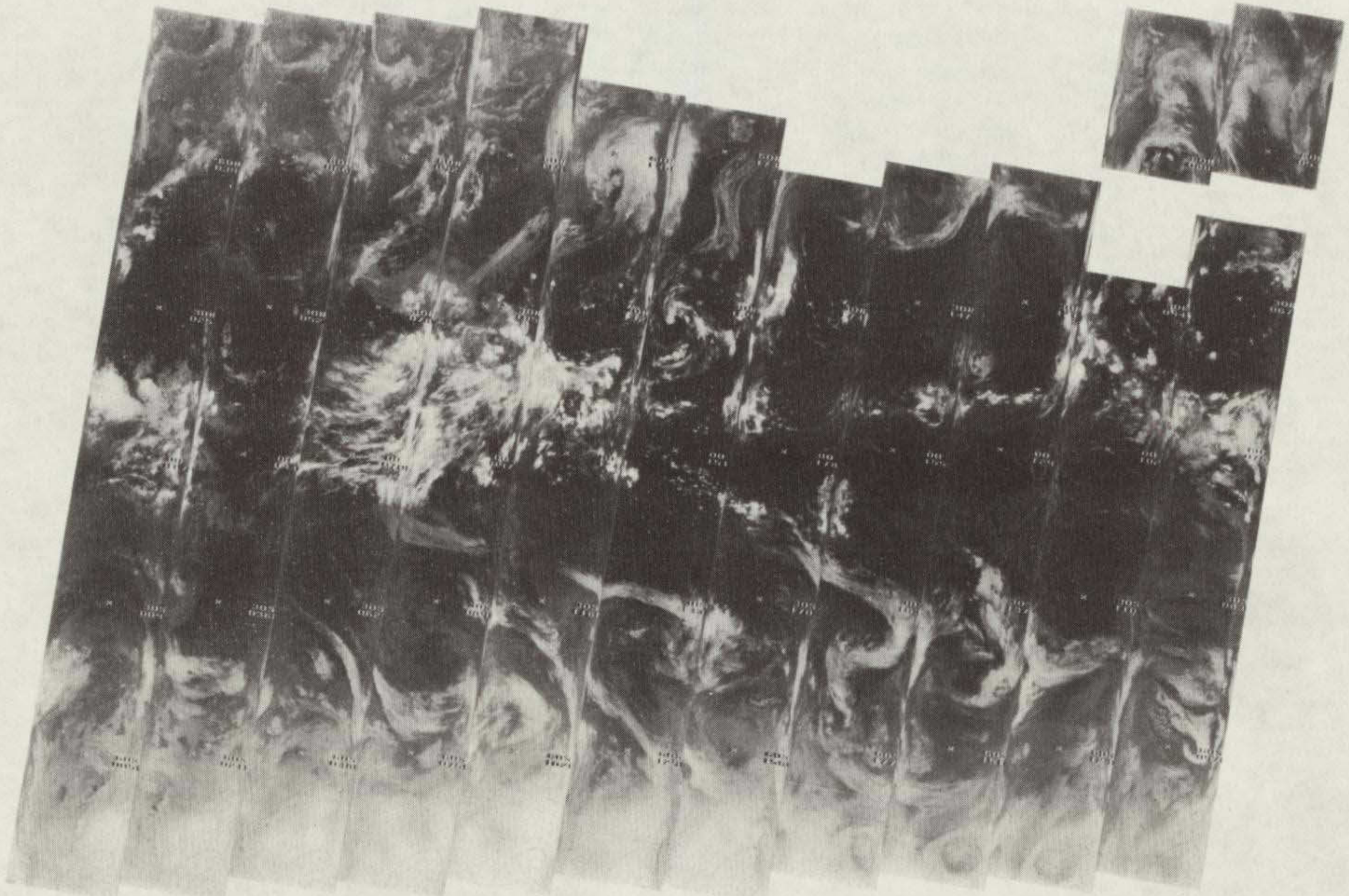
11.5 μm



1015 1014 1013 1012 1011 1010 1009 1008 1007 1006 1005 1004 1003 1002

26 AUGUST 1975

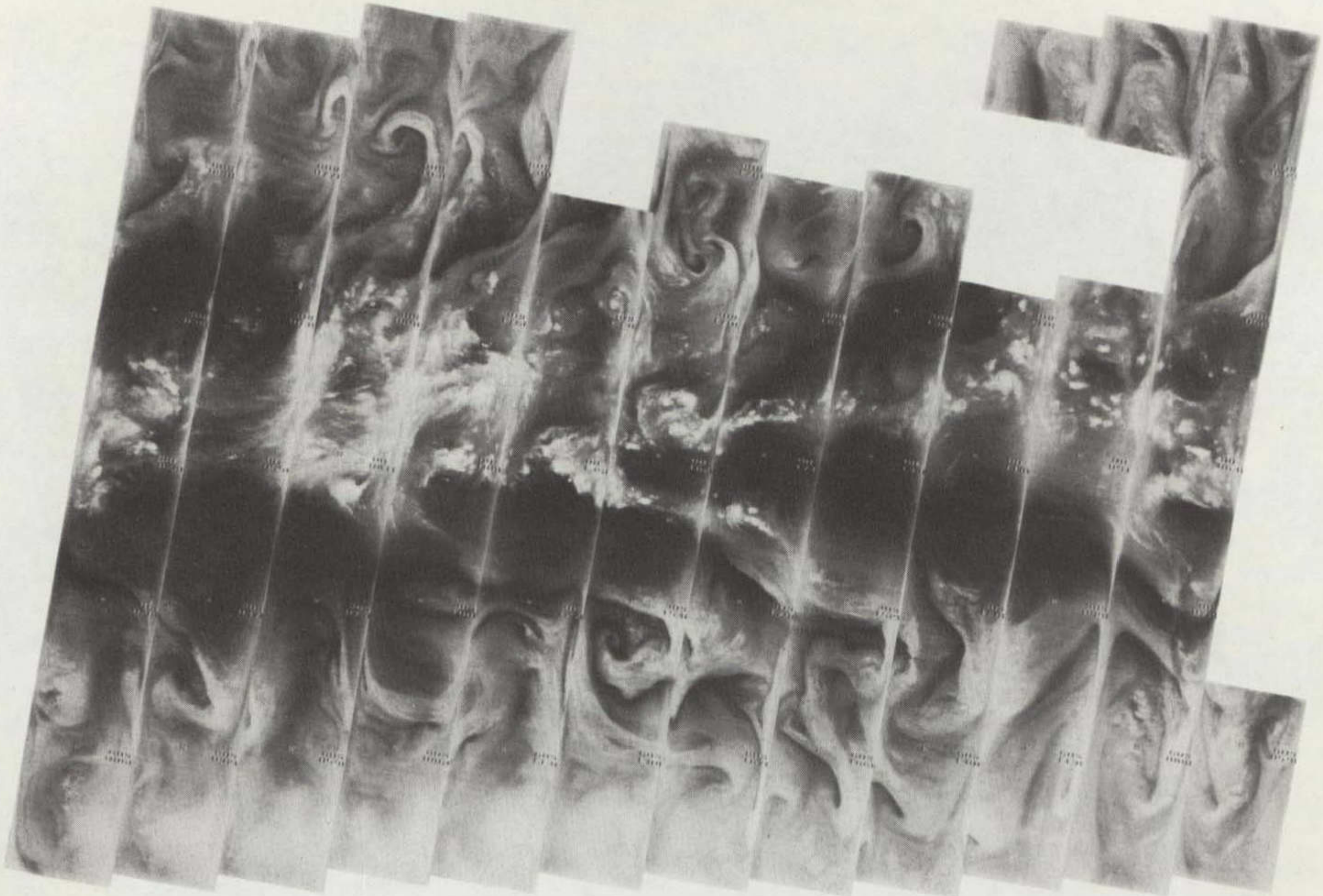
6.7 μm



1015 1014 1013 1012 1011 1010 1009 1008 1007 1006 1005 1004 1003 1002

26 AUGUST 1975

11.5 μm



1028 1027 1026 1025 1024 1023 1022 1021 1020 1019 1018 1017 1016

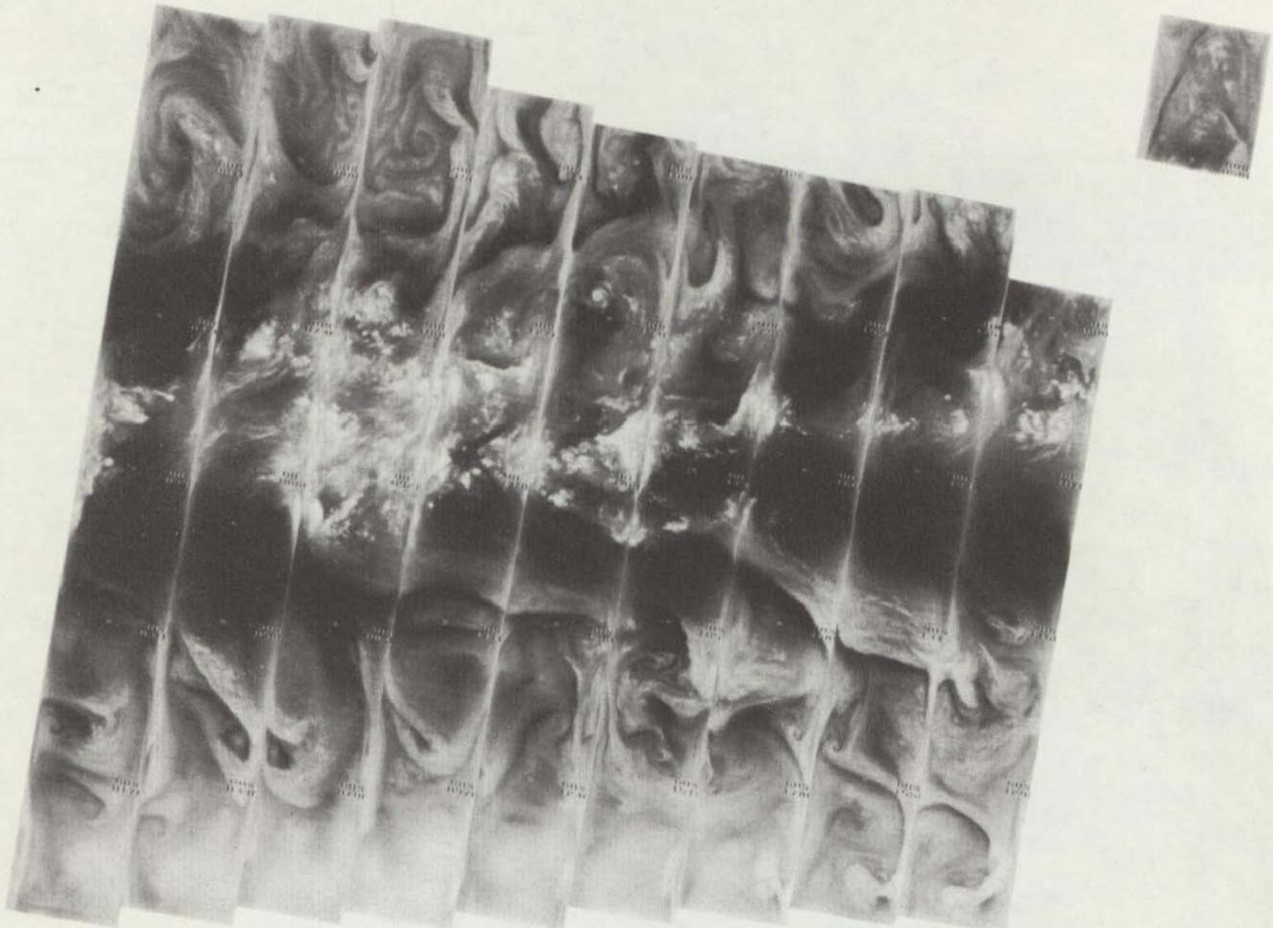
27 AUGUST 1975

6.7 μm

1028 1027 1026 1025 1024 1023 1022 1021 1020 1019 1018 1017 1016

27 AUGUST 1975

11.5 μm



1042 1041 1040 1039 1038 1037 1036 1035 1034 1033 1032 1031 1030 1029

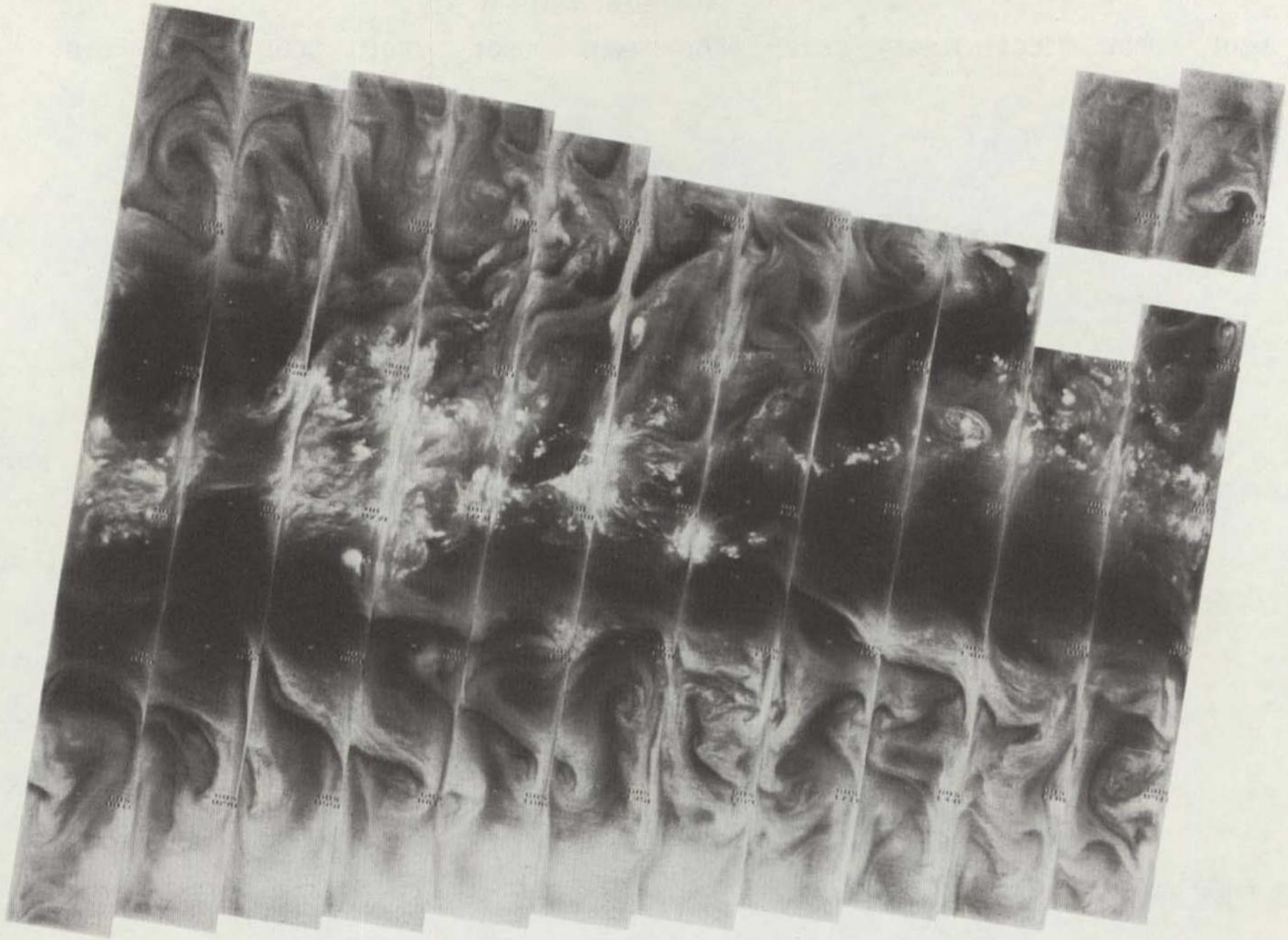
28 AUGUST 1975

6.7 μm

1042 1041 1040 1039 1038 1037 1036 1035 1034 1033 1032 1031 1030 1029

28 AUGUST 1975

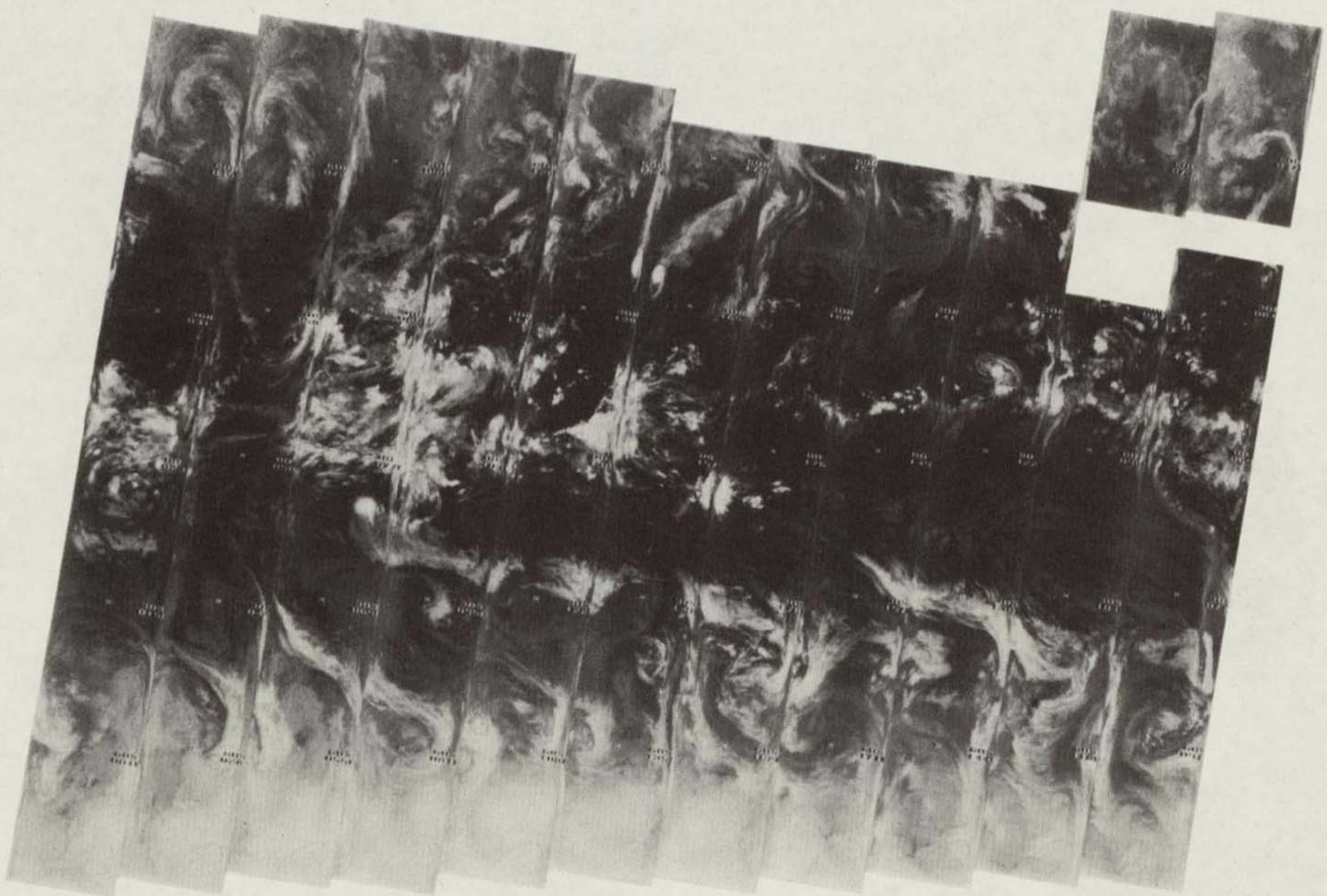
11.5 μm



1055 1054 1053 1052 1051 1050 1049 1048 1047 1046 1045 1044 1043

29 AUGUST 1975

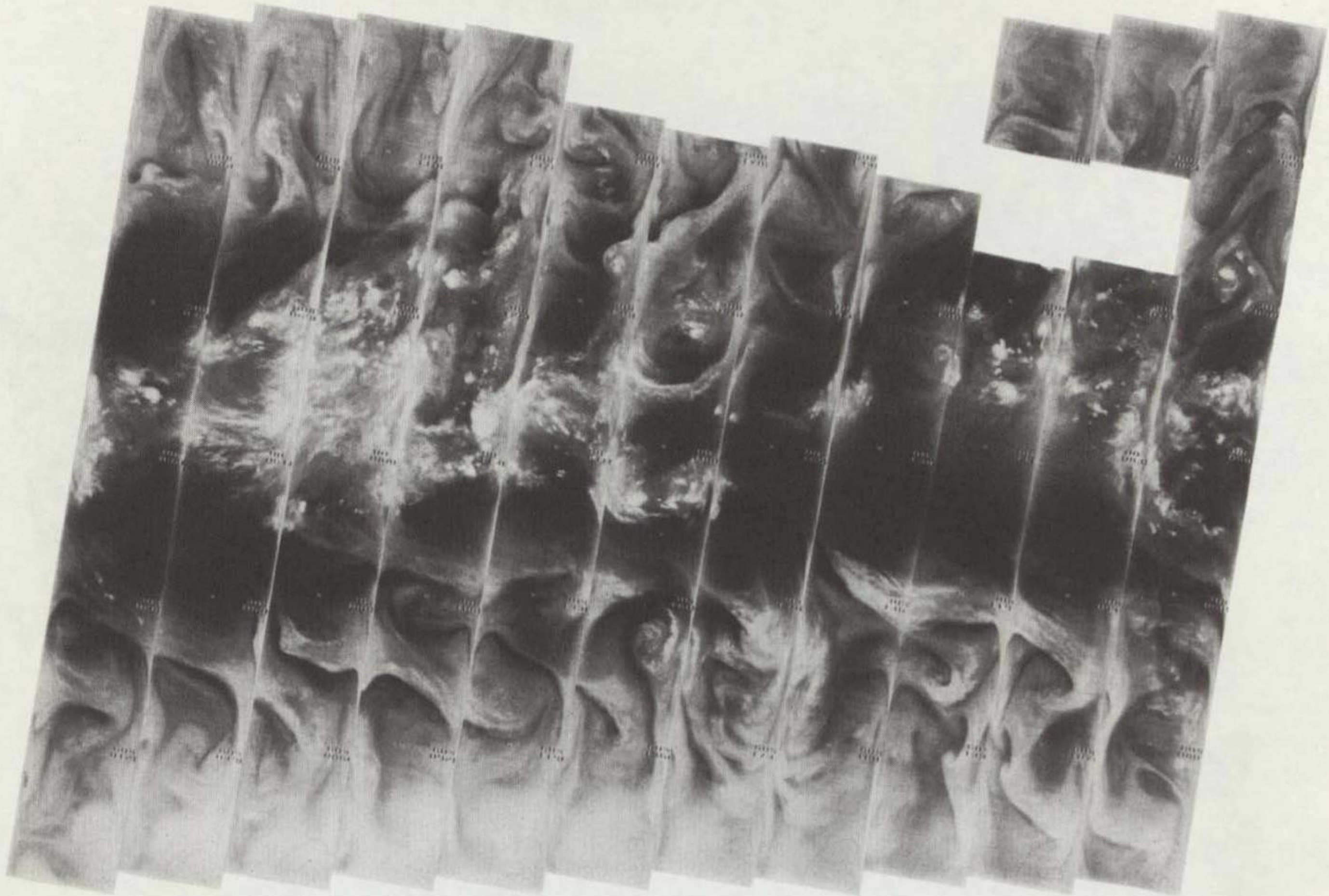
6.7 μm



1055 1054 1053 1052 1051 1050 1049 1048 1047 1046 1045 1044 1043

29 AUGUST 1975

11.5 μm



1068 1067 1066 1065 1064 1063 1062 1061 1060 1059 1058 1057 1056

30 AUGUST 1975

6.7 μm

1068 1067 1066 1065 1064 1063 1062 1061 1060 1059 1058 1057 1056

30 AUGUST 1975

11.5 μm

1082 1081 1080 1079 1078 1077 1076 1075 1074 1073 1072 1071 1070 1069

31 AUGUST 1975

6.7 μm

C-3

1082 1081 1080 1079 1078 1077 1076 1075 1074 1073 1072 1071 1070 1069

31 AUGUST 1975

11.5 μm

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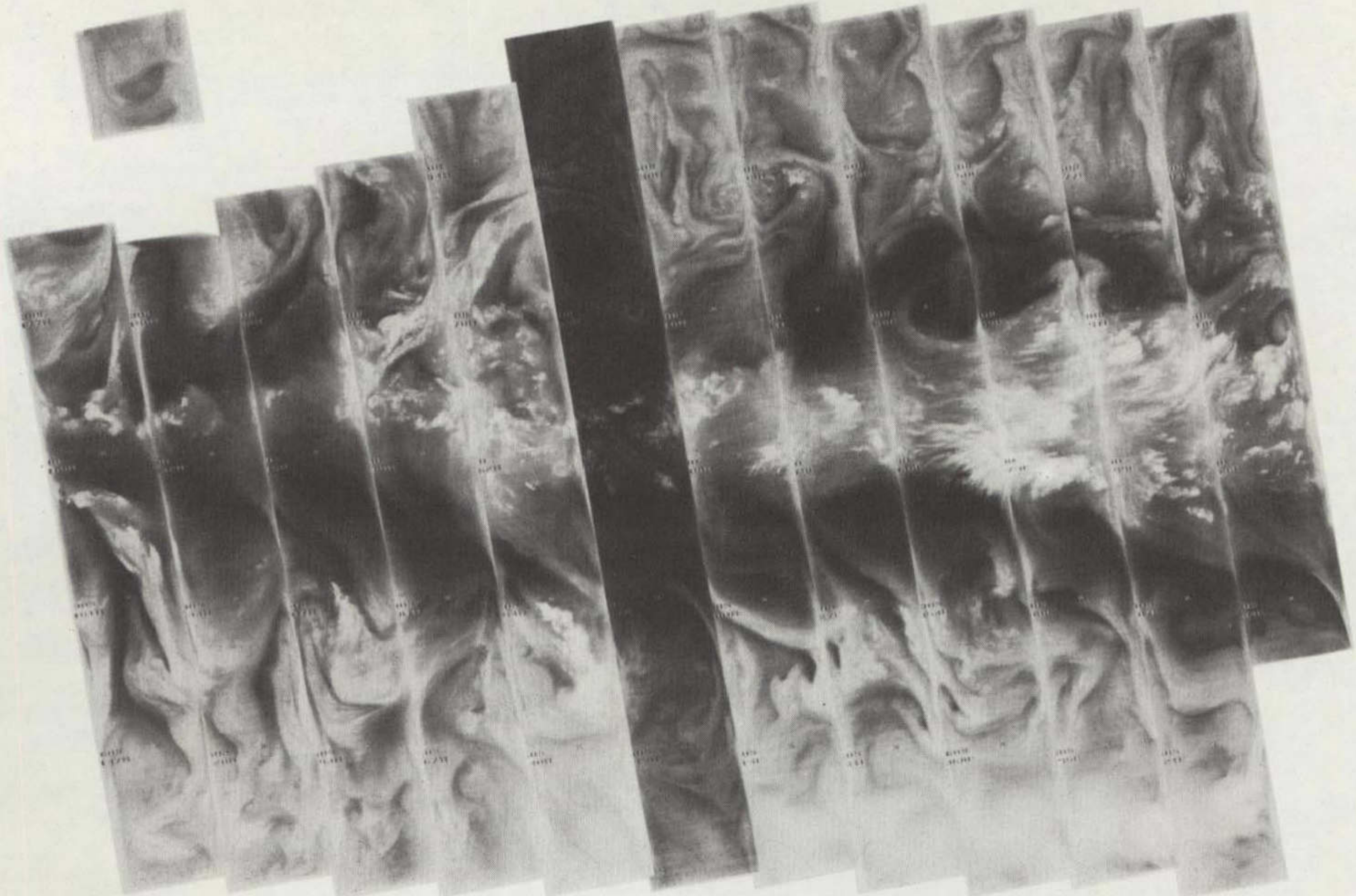
SECTION 4.2

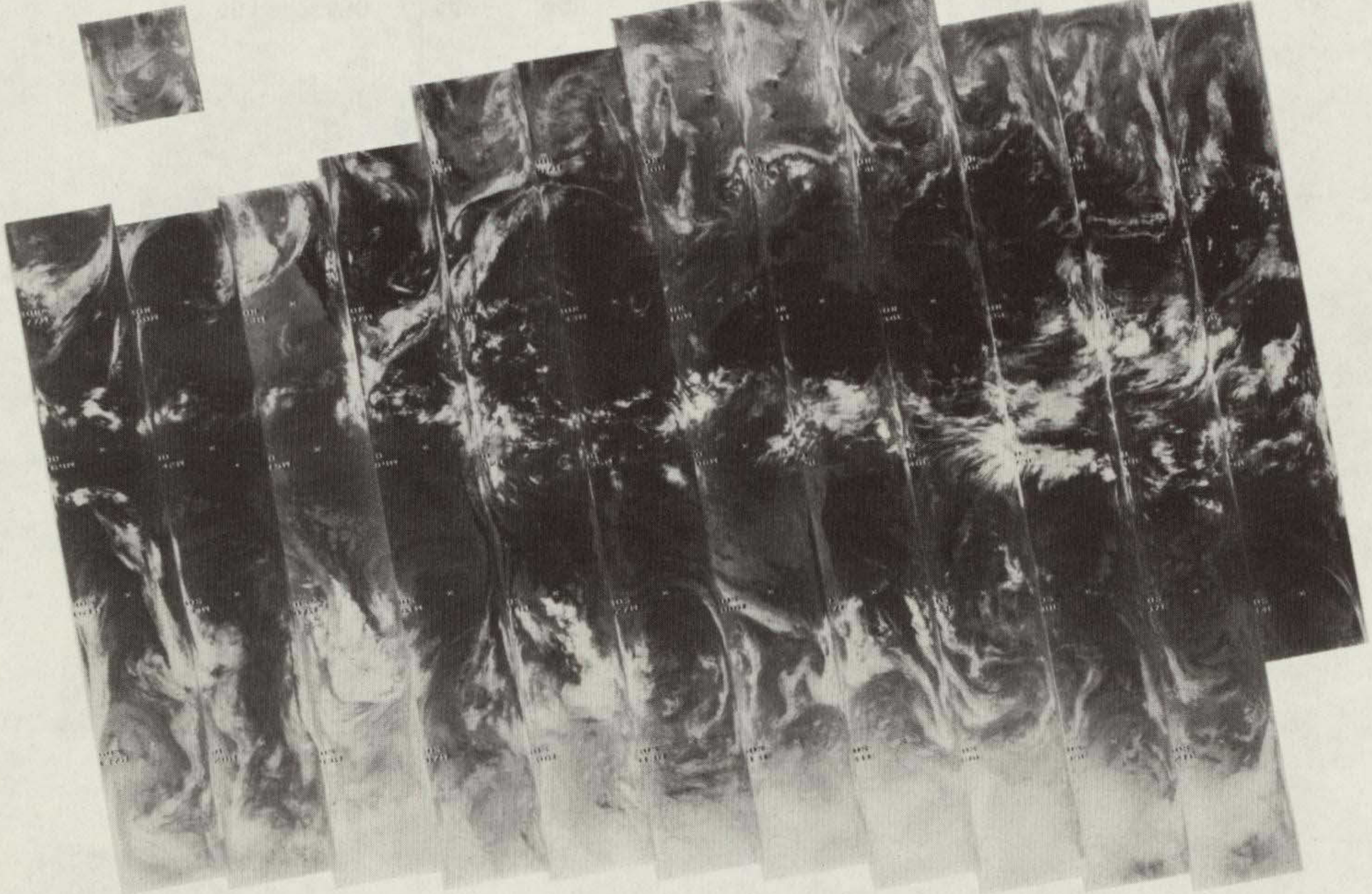
TEMPERATURE HUMIDITY INFRARED RADIOMETER DAYTIME MONTAGES



438 437 436 435 434 433 432 431 430 429 428 427 426

14 JULY 1975

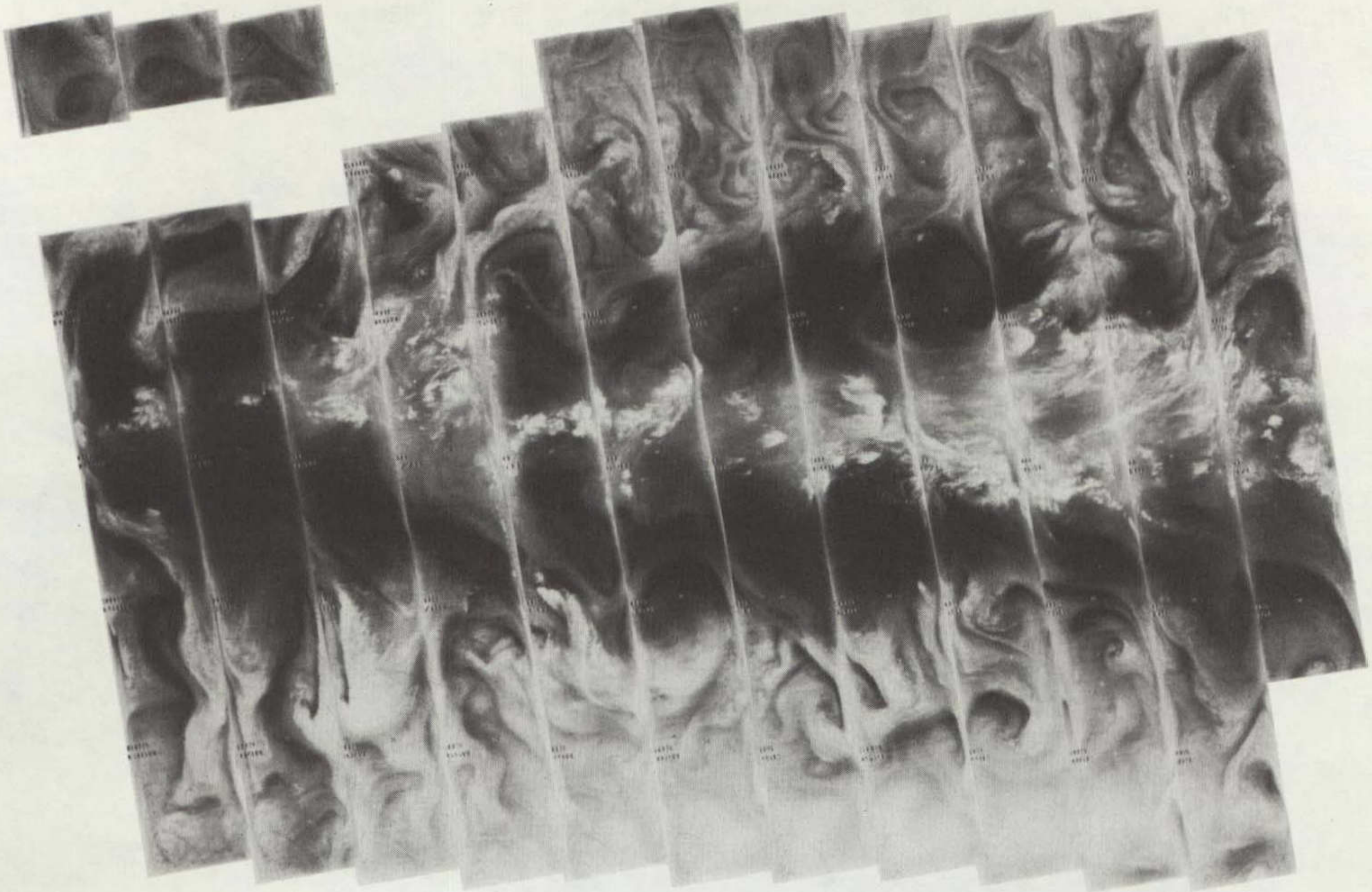
6.7 μm



438 437 436 435 434 433 432 431 430 429 428 427 426

14 JULY 1975

11.5 μm



451 450 449 448 447 446 445 444 443 442 441 440 439

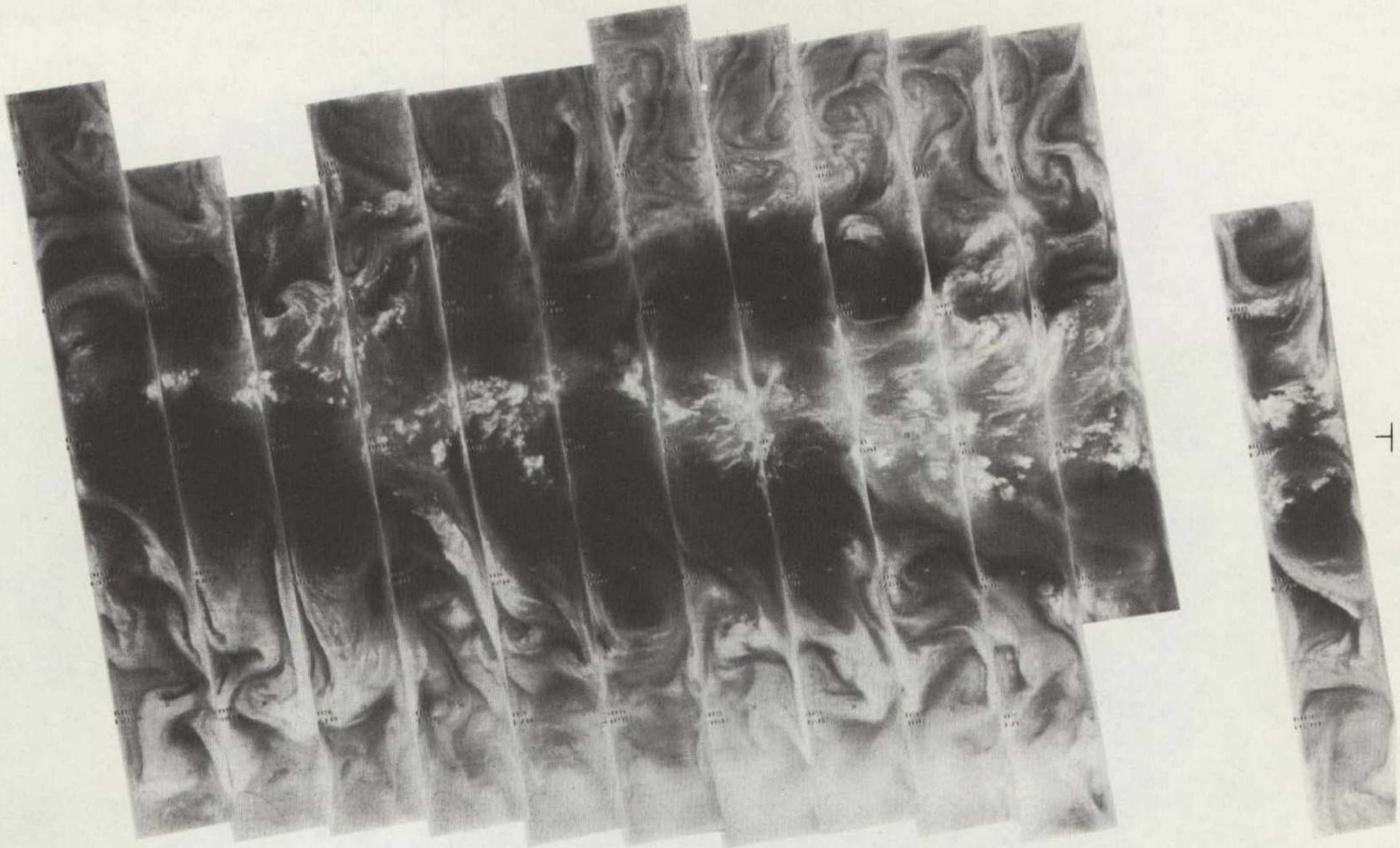
15 JULY 1975

6.7 μm

451 450 449 448 447 446 445 444 443 442 441 440 439

15 JULY 1975

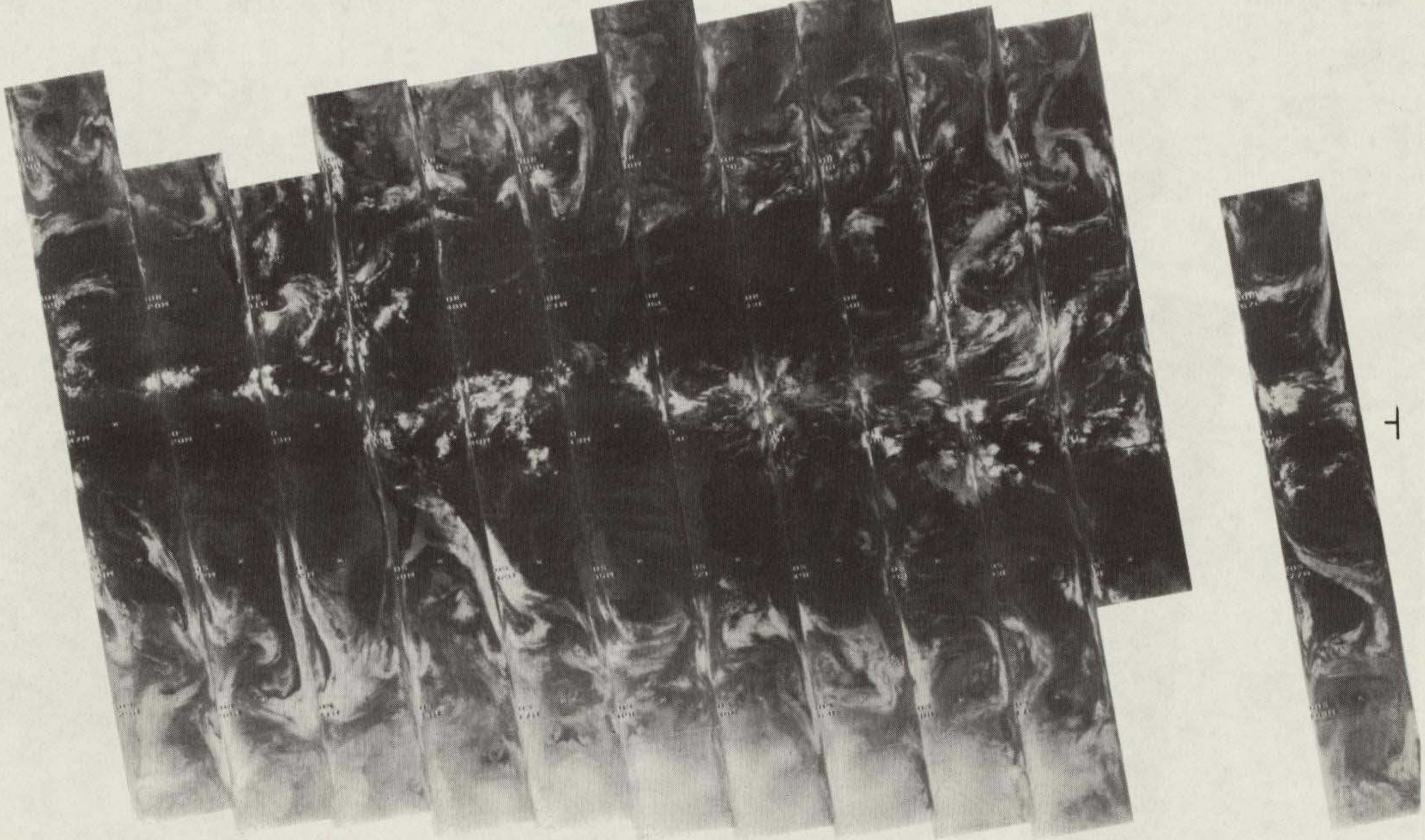
11.5 μm



465 464 463 462 461 460 459 458 457 456 455 454 453 452

16 JULY 1975

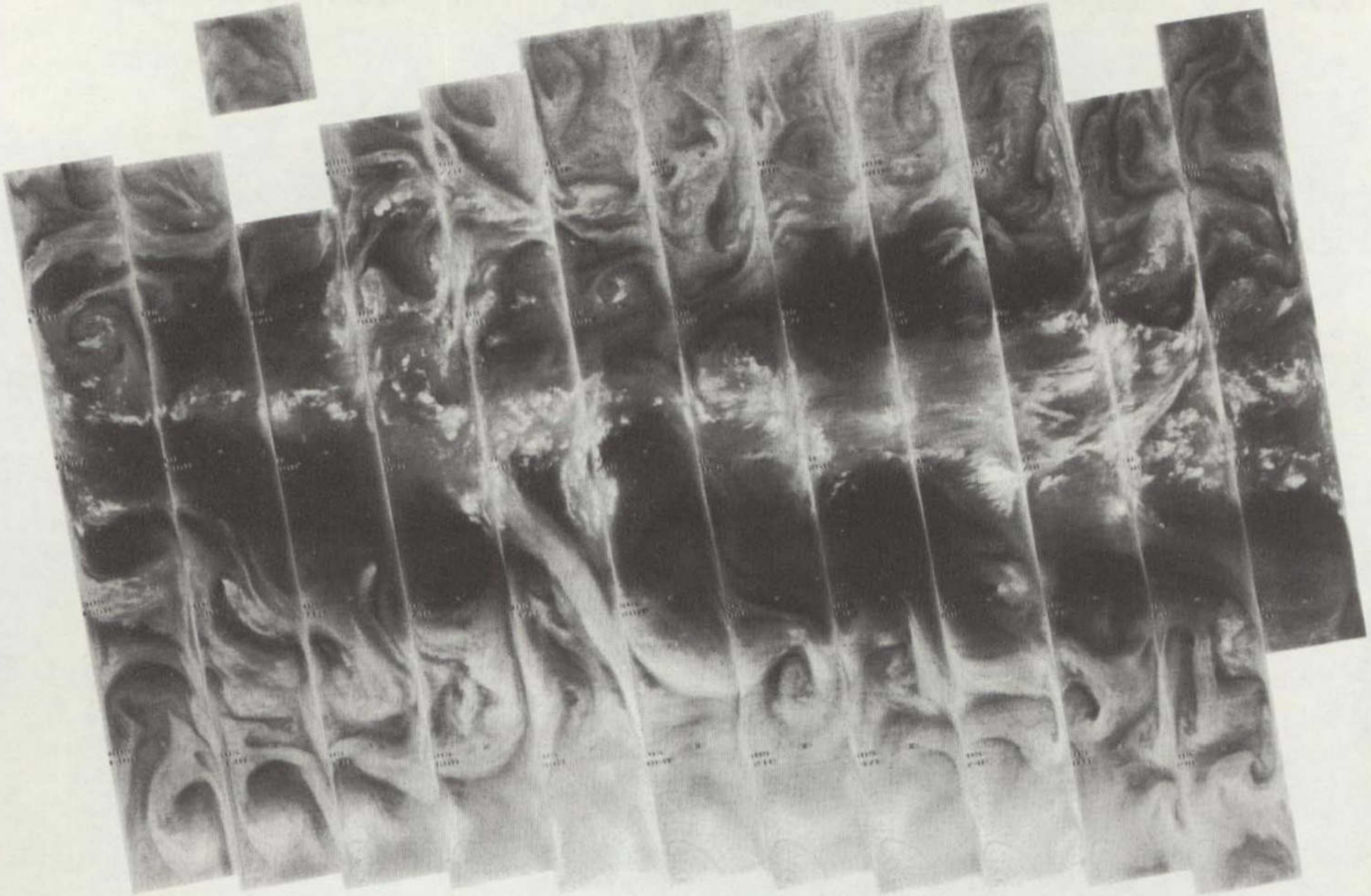
6.7 μm



465 464 463 462 461 460 459 458 457 456 455 454 453 452

16 JULY 1975

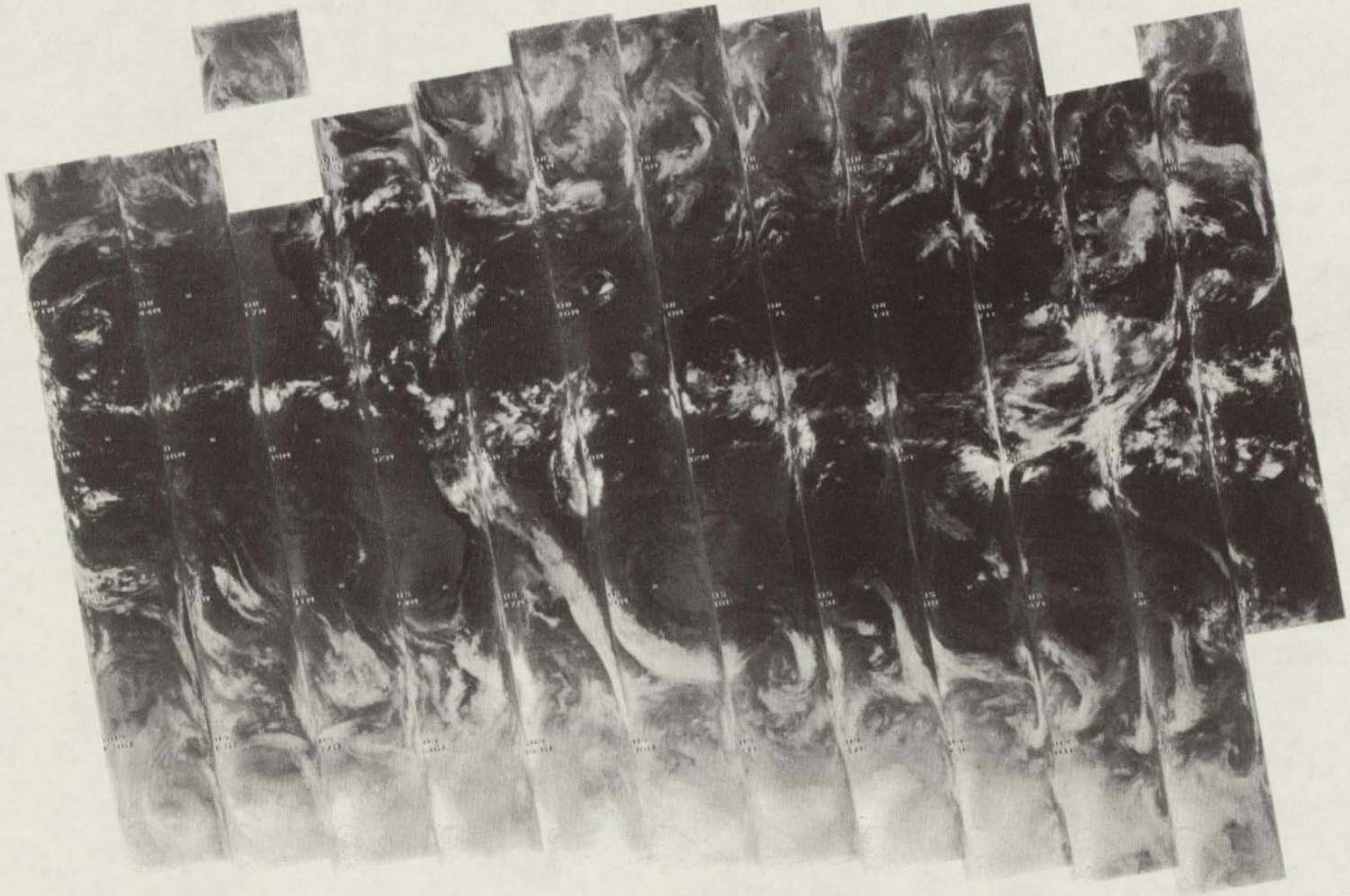
11.5 μm



478 477 476 475 474 473 472 471 470 469 468 467 466

17 JULY 1975

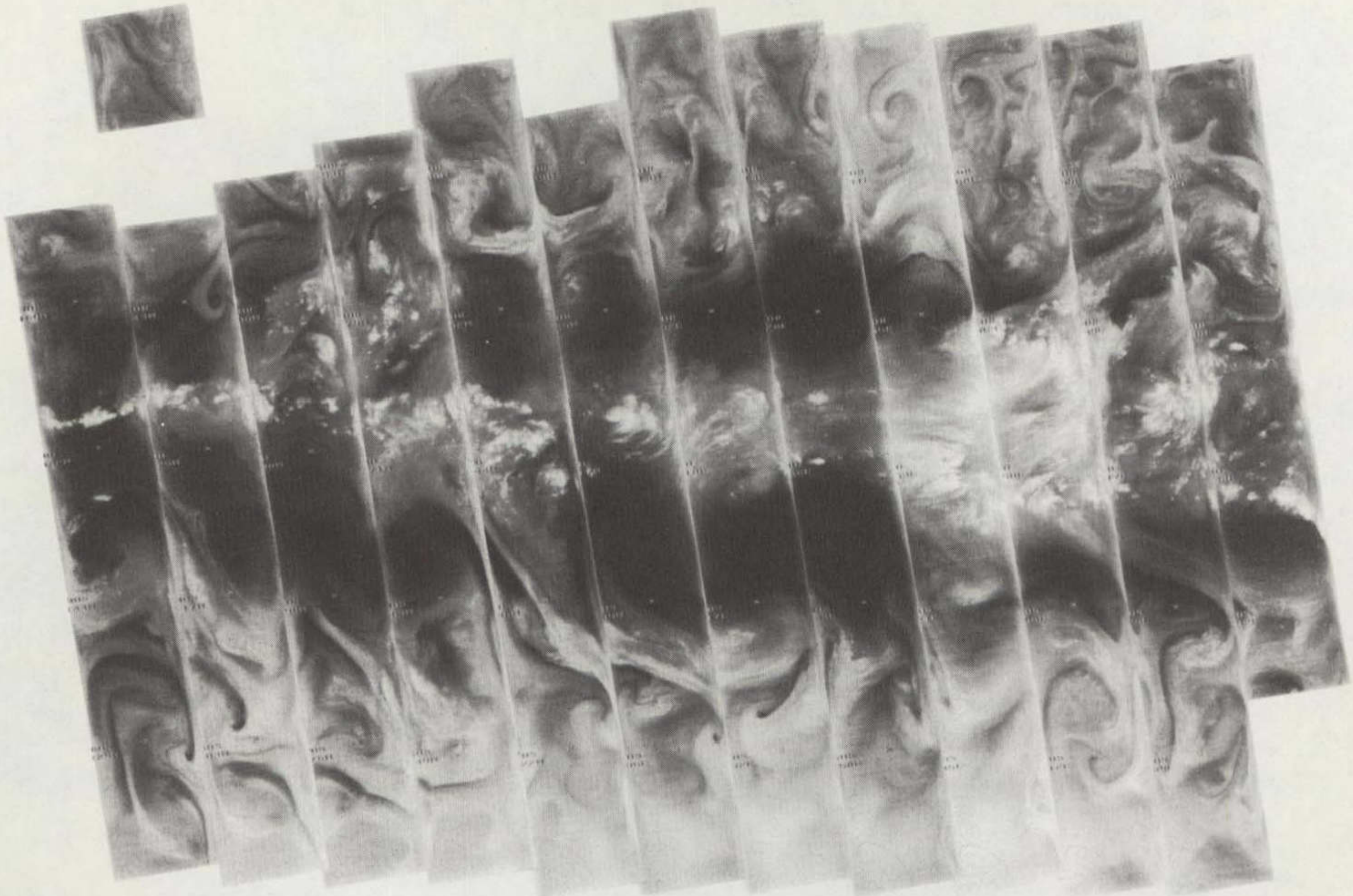
6.7 μm



478 477 476 475 474 473 472 471 470 469 468 467 466

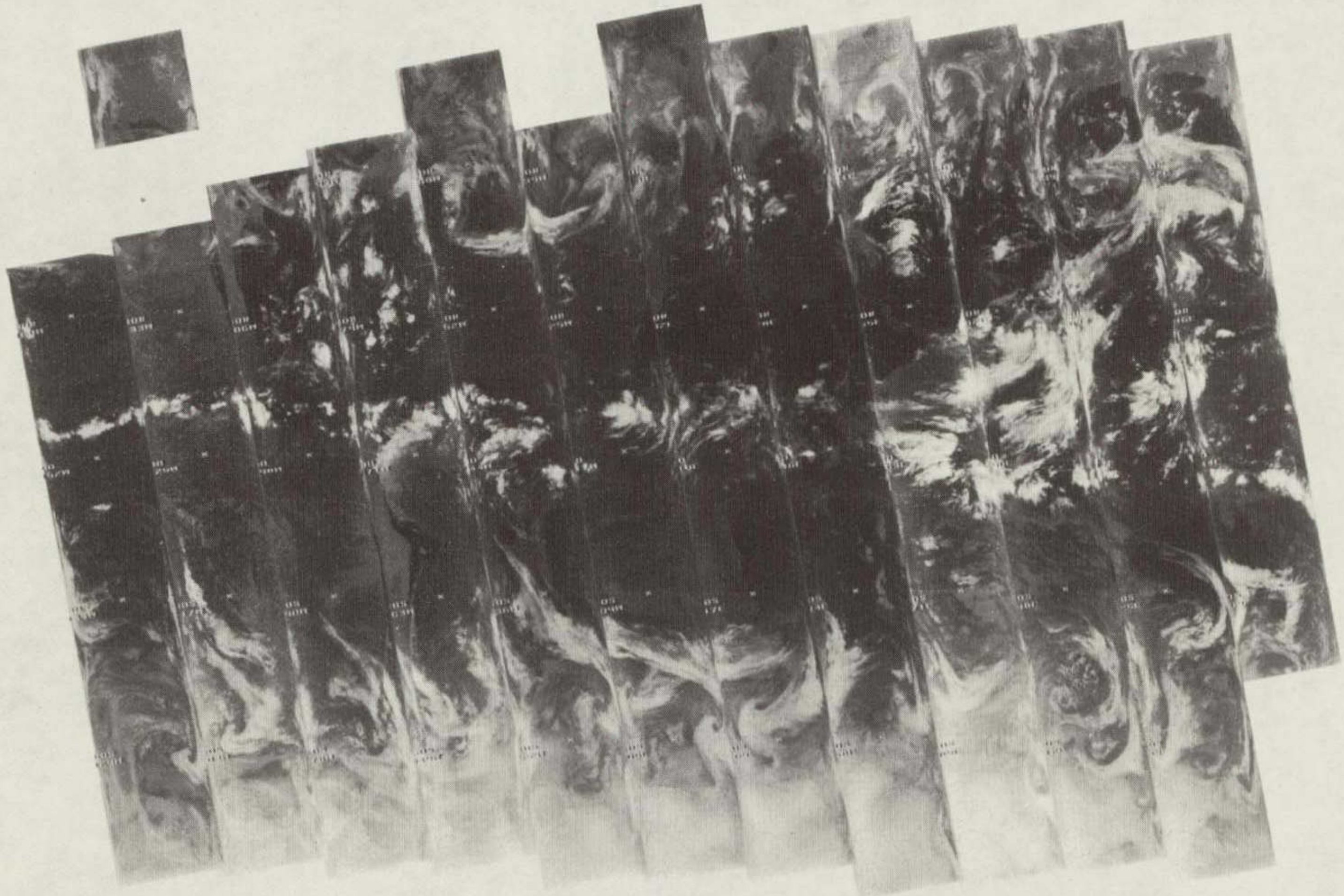
17 JULY 1975

11.5 μm



18 JULY 1975

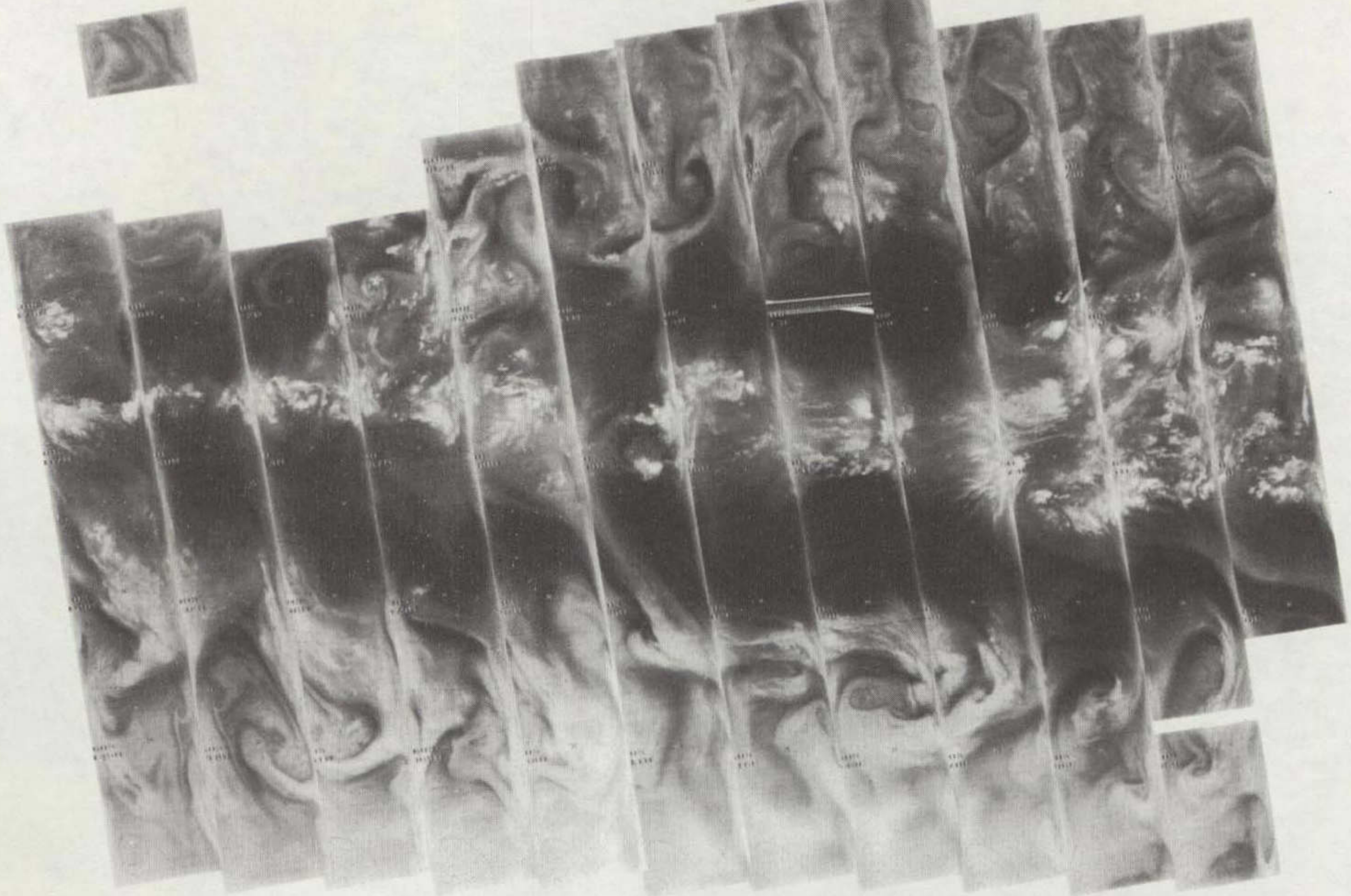
6.7 μm



492 491 490 489 488 487 486 485 484 483 482 481 480 479

18 JULY 1975

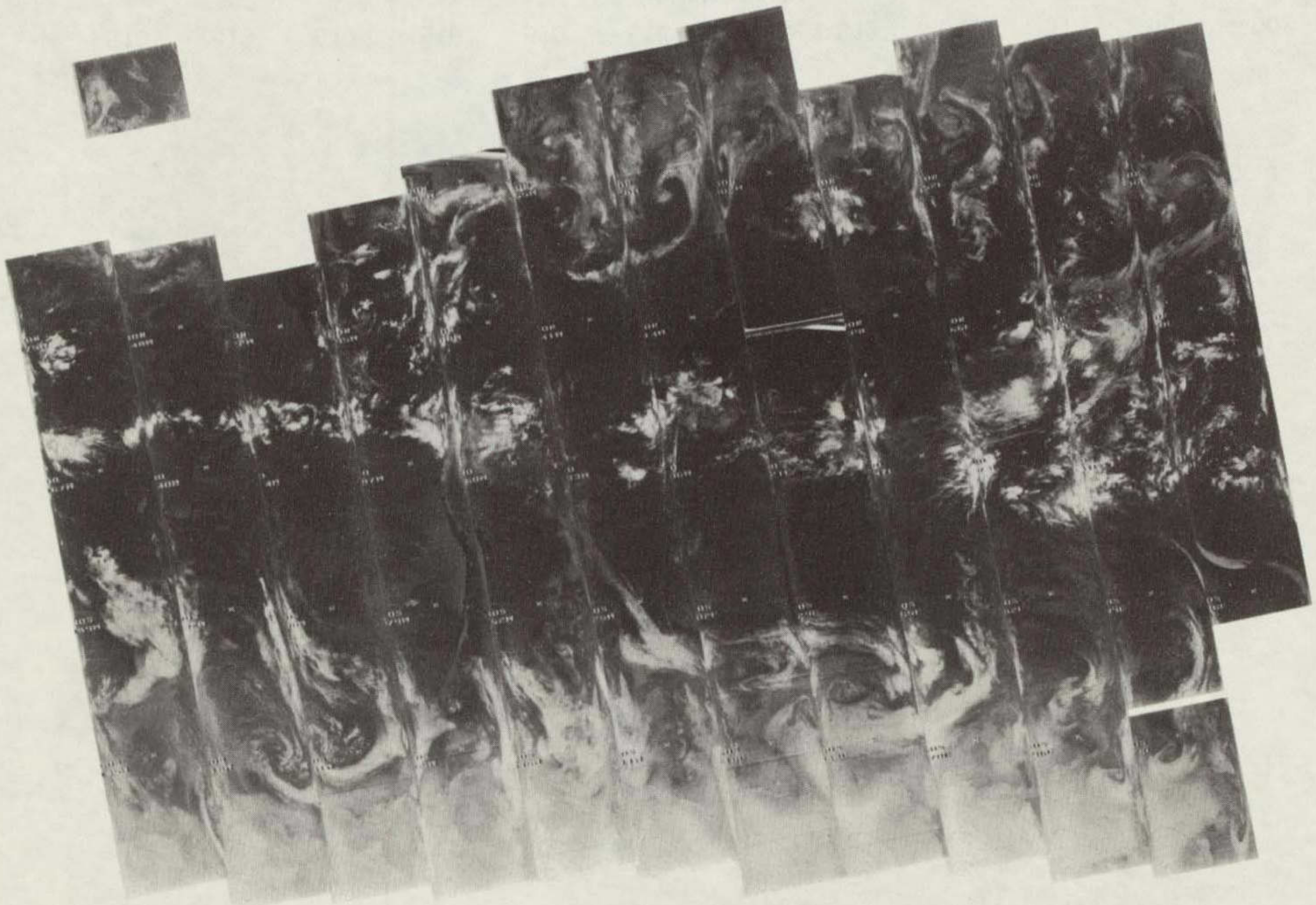
11.5 μm



505 504 503 502 501 500 499 498 497 496 495 494 493

19 JULY 1975

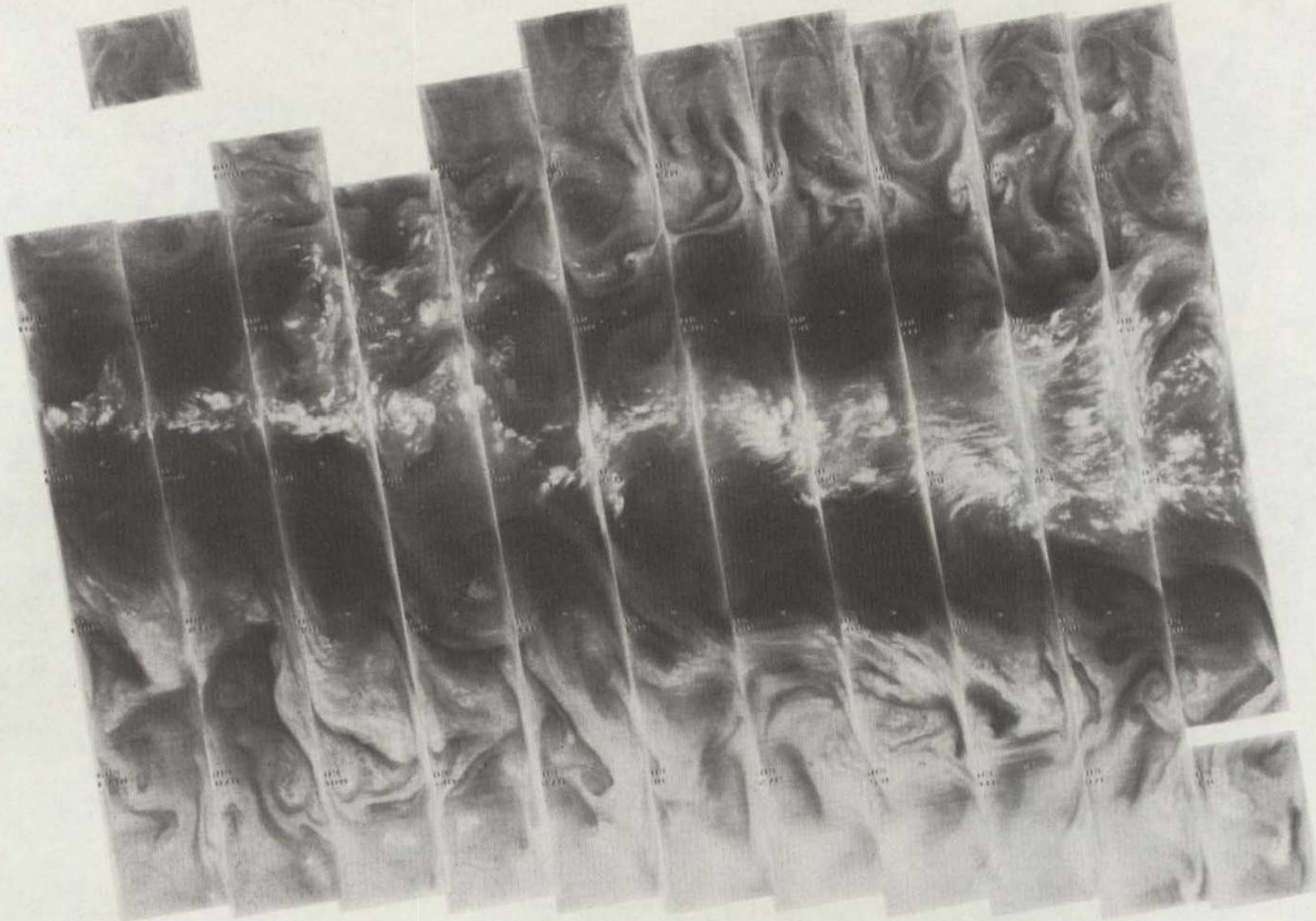
6.7 μm



505 504 503 502 501 500 499 498 497 496 495 494 493

19 JULY 1975

11.5 μm



519 518 517 516 515 514 513 512 511 510 509 508 507 506

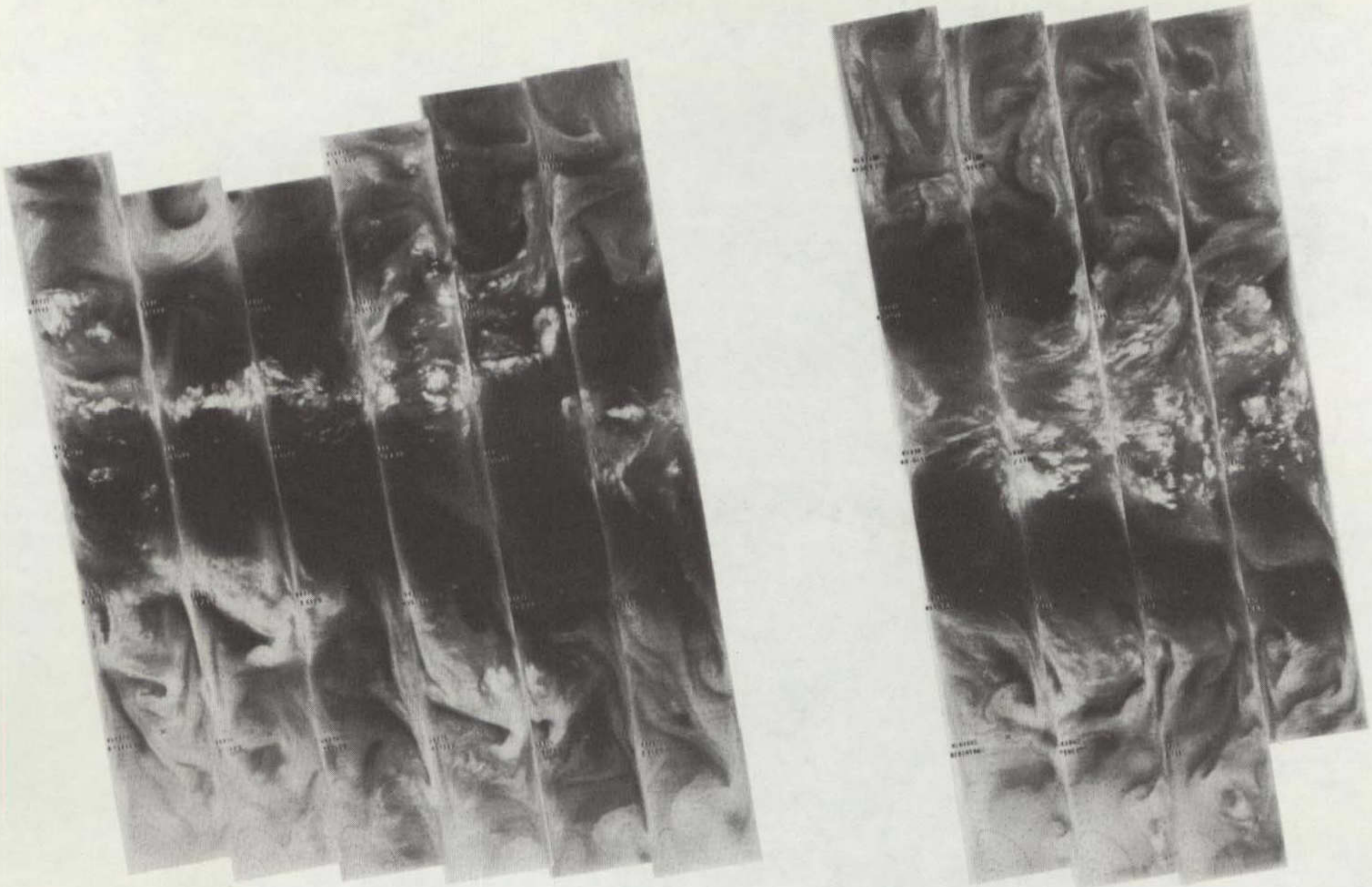
20 JULY 1975

6.7 μm

519 518 517 516 515 514 513 512 511 510 509 508 507 506

20 JULY 1975

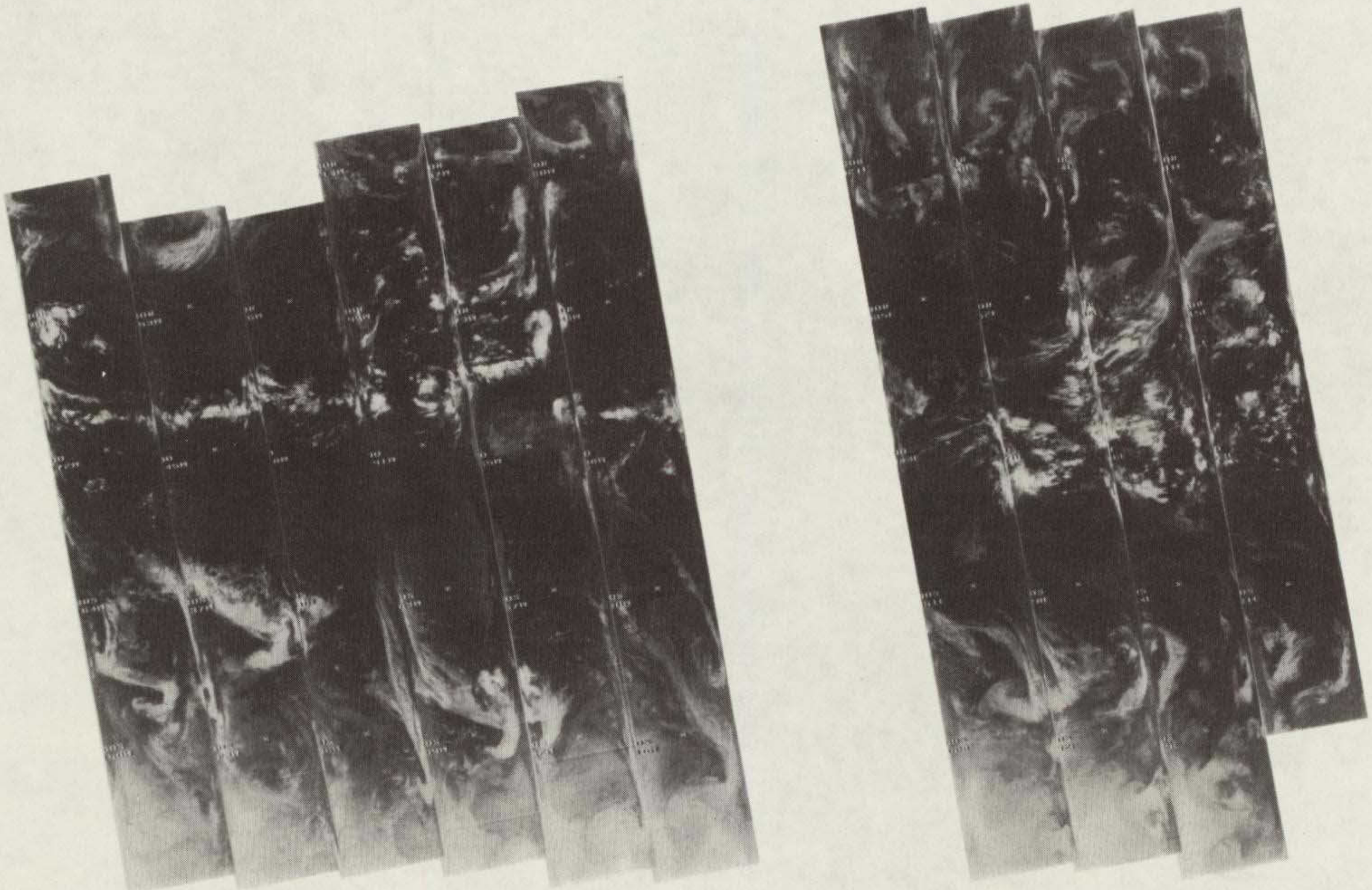
11.5 μm



532 531 530 529 528 527 526 525 524 523 522 521 520

21 JULY 1975

6.7 μm



532 531 530 529 528 527 526 525 524 523 522 521 520

21 JULY 1975

11.5 μm

545 544 543 542 541 540 539 538 537 536 535 534 533

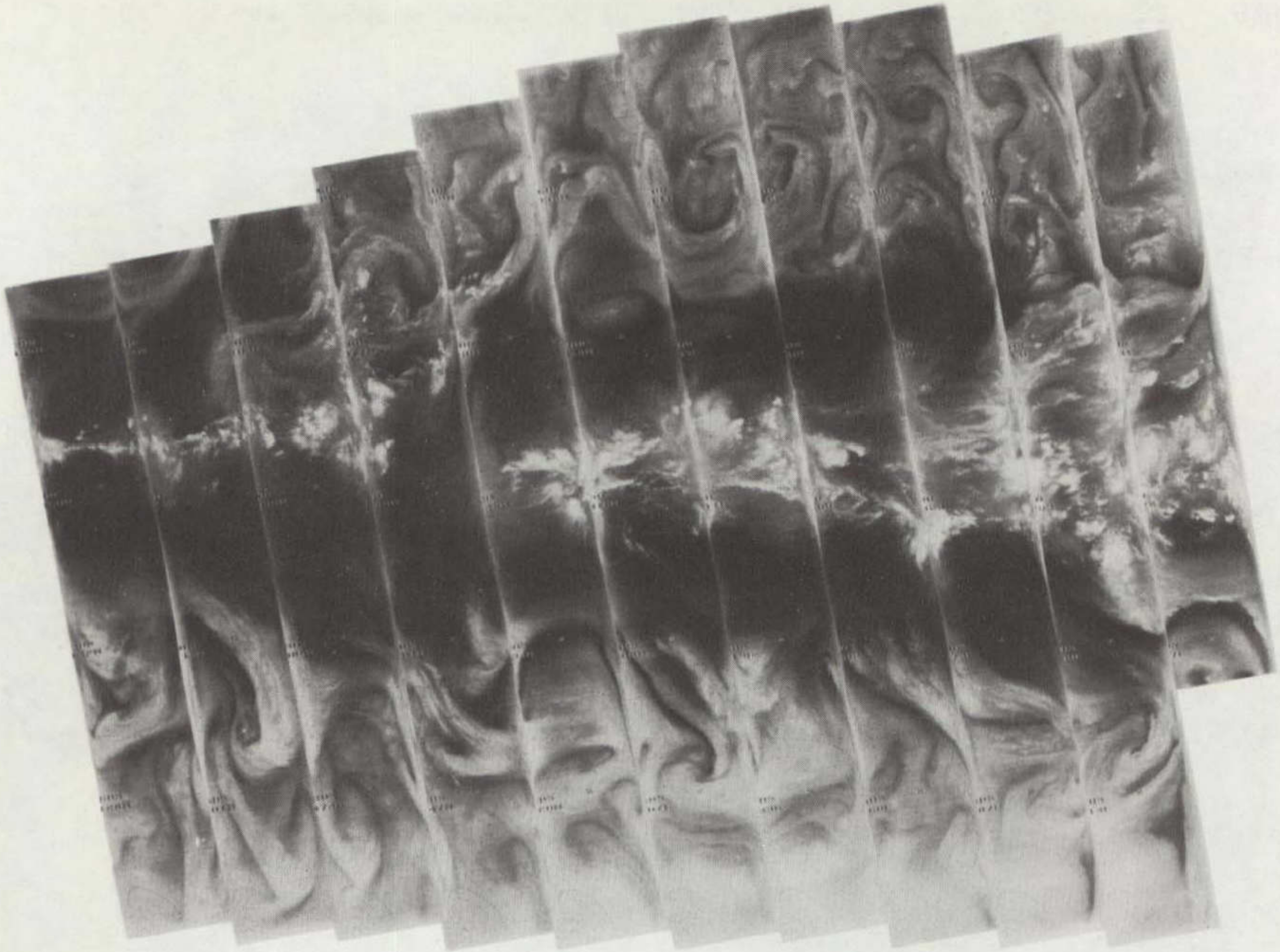
22 JULY 1975

6.7 μm

545 544 543 542 541 540 539 538 537 536 535 534 533

22 JULY 1975

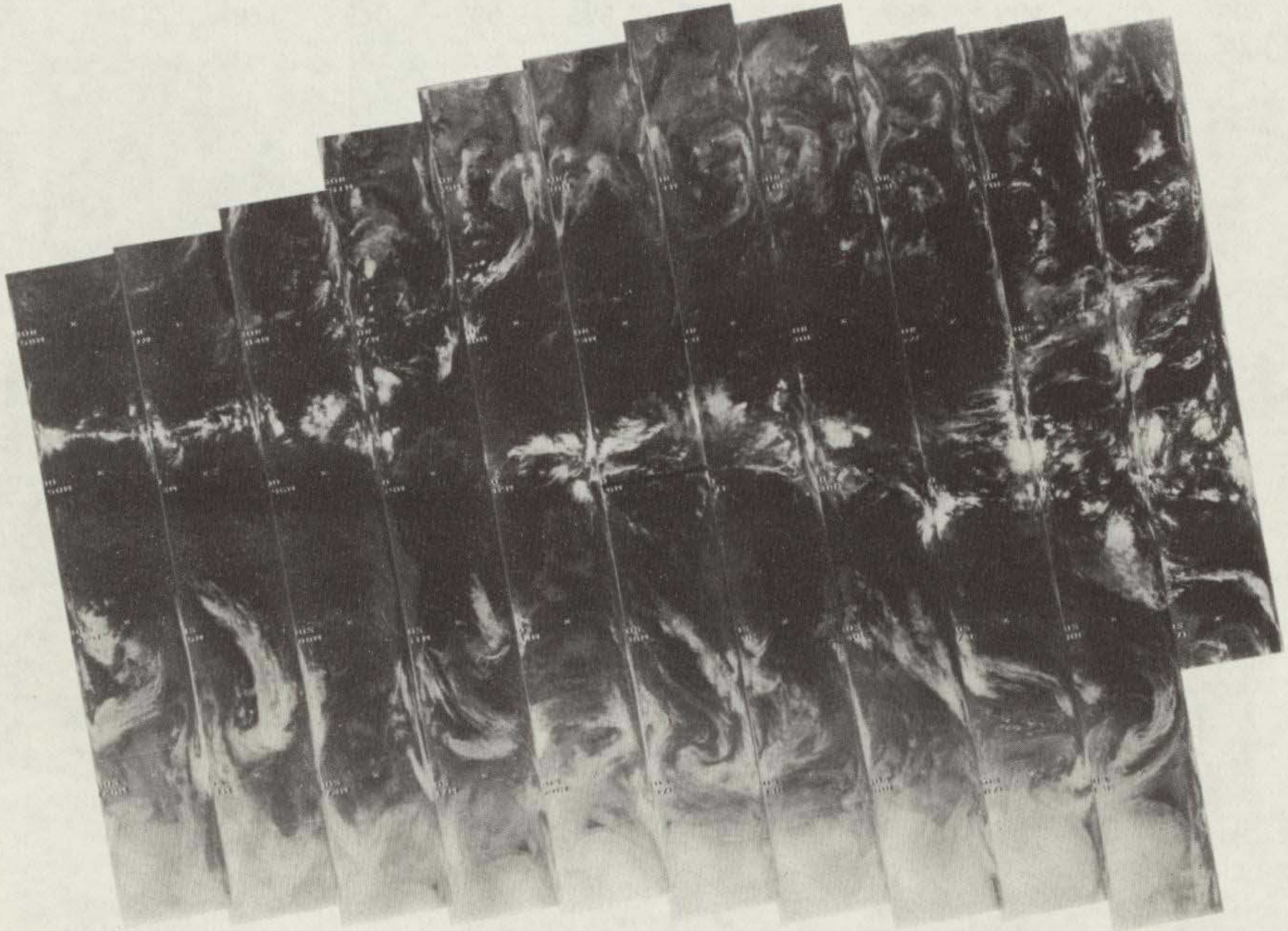
11.5 μm



559 558 557 556 555 554 553 552 551 550 549 548 547 546

23 JULY 1975

6.7 μm



559 558 557 556 555 554 553 552 551 550 549 548 547 546

23 JULY 1975

11.5 μm

572 571 570 569 568 567 566 565 564 563 562 561 560

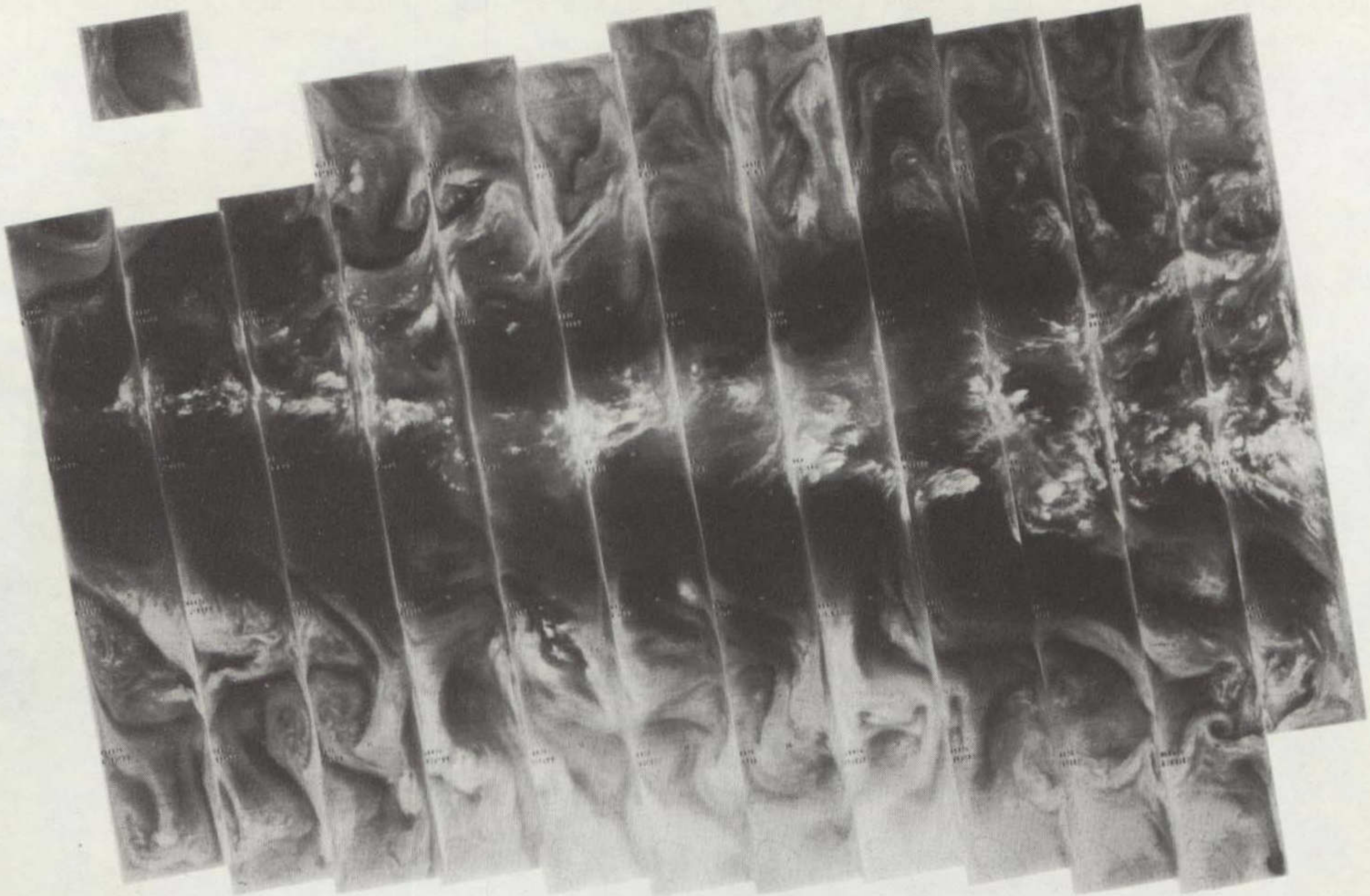
24 JULY 1975

6.7 μm

572 571 570 569 568 567 566 565 564 563 562 561 560

24 JULY 1975

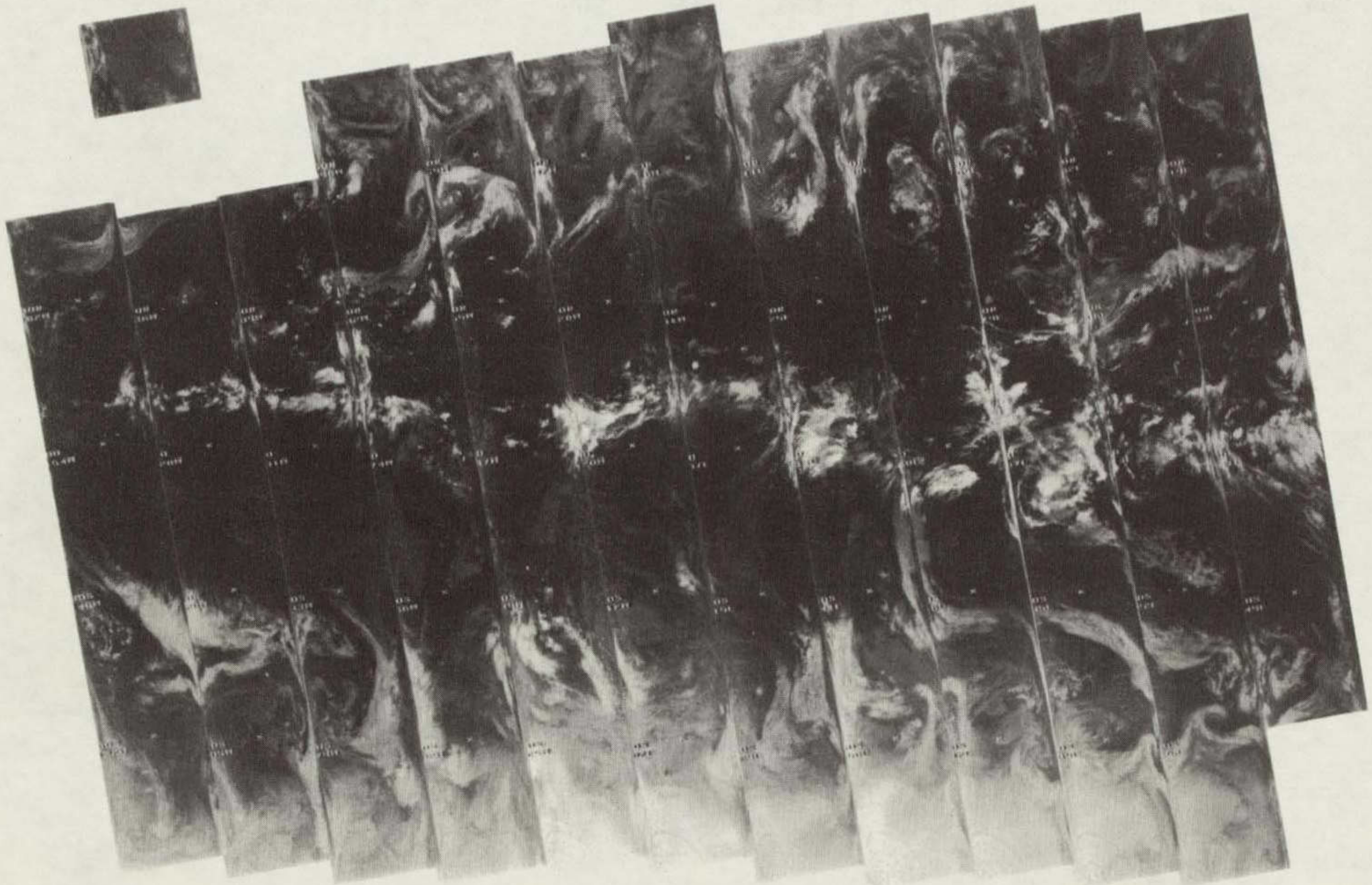
11.5 μm



586 585 584 583 582 581 580 579 578 577 576 575 574 573

25 JULY 1975

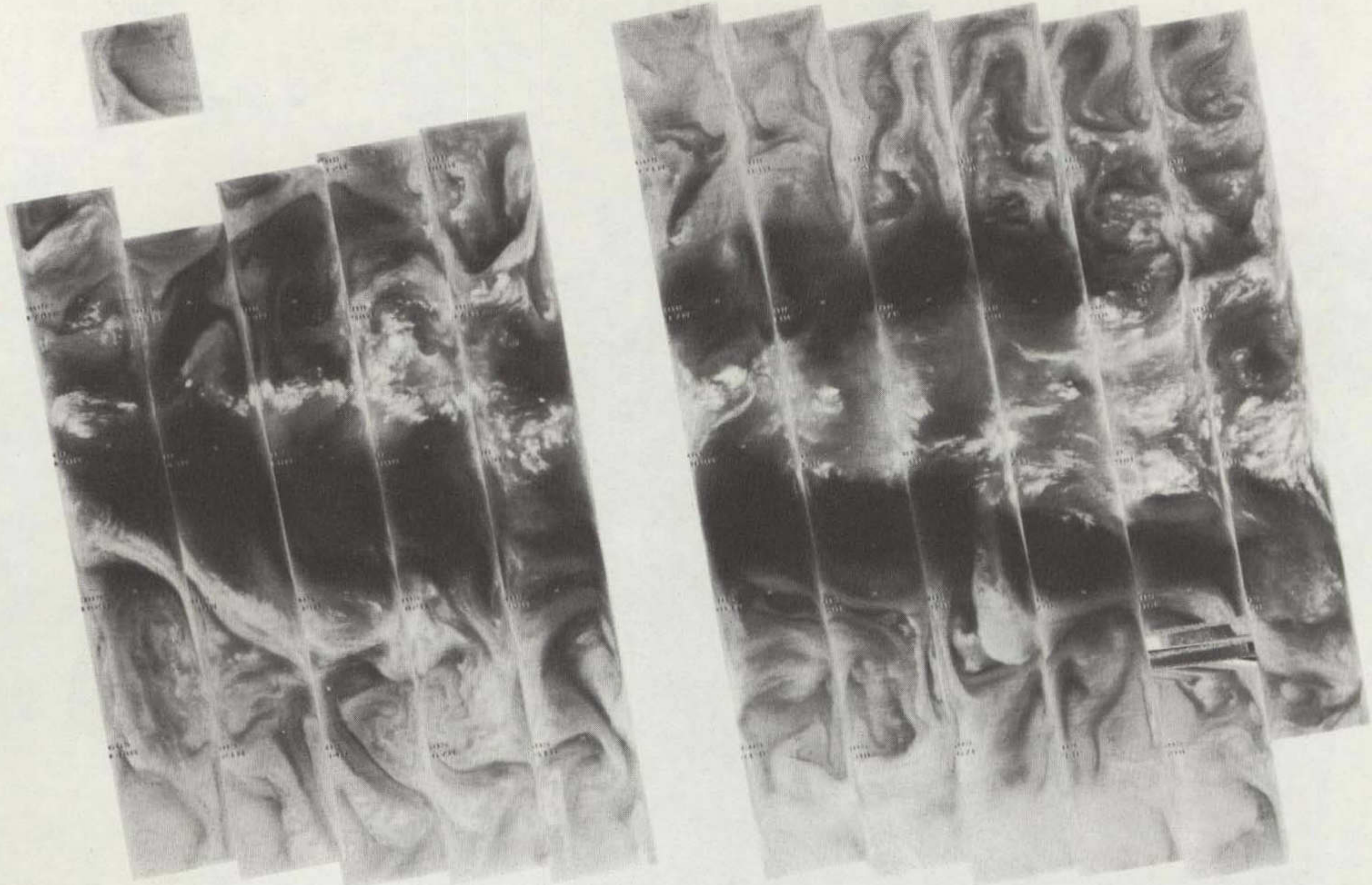
6.7 μm



586 585 584 583 582 581 580 579 578 577 576 575 574 573

25 JULY 1975

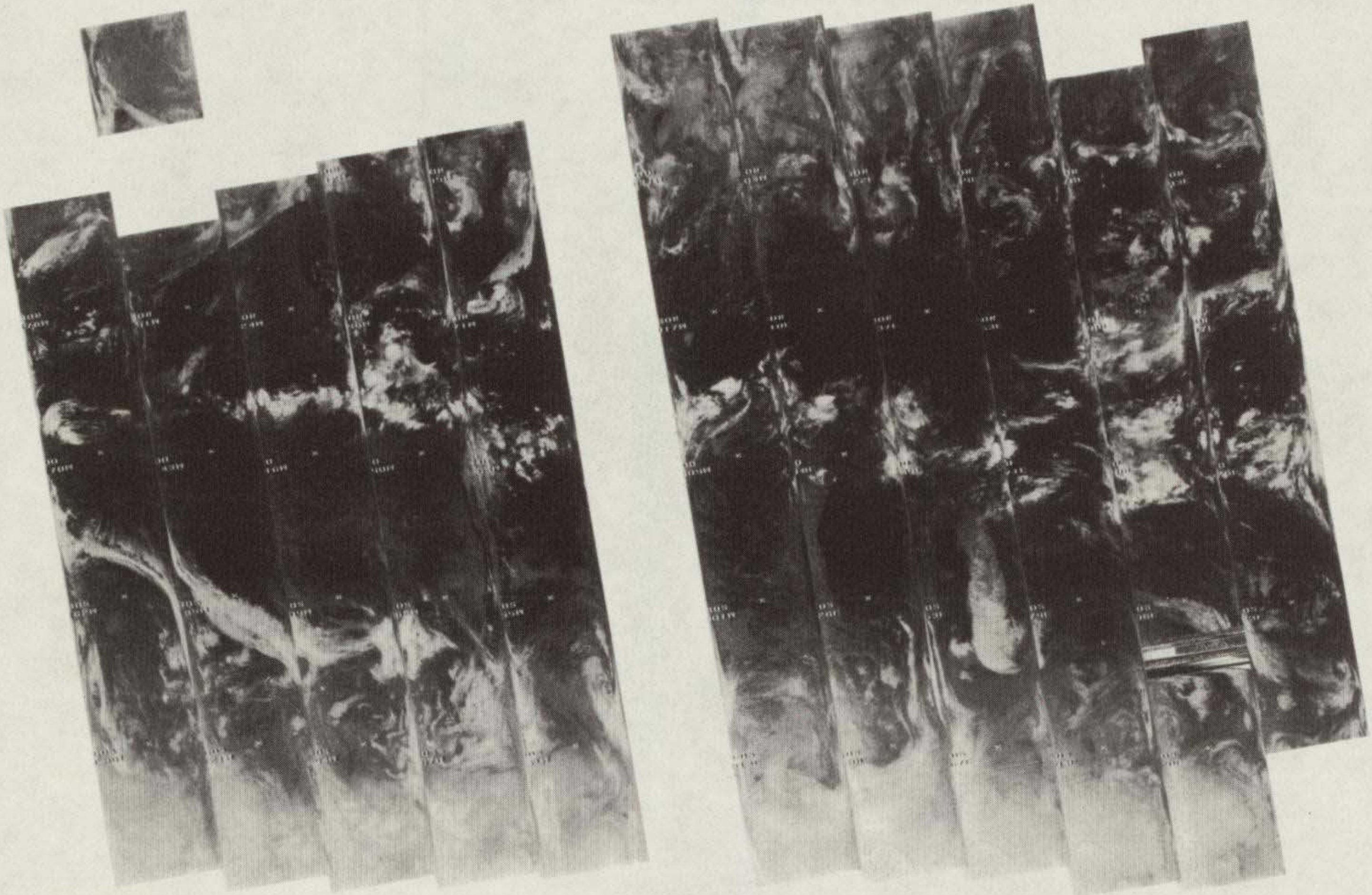
11.5 μm



599 598 597 596 595 594 593 592 591 590 589 588 587

26 JULY 1975

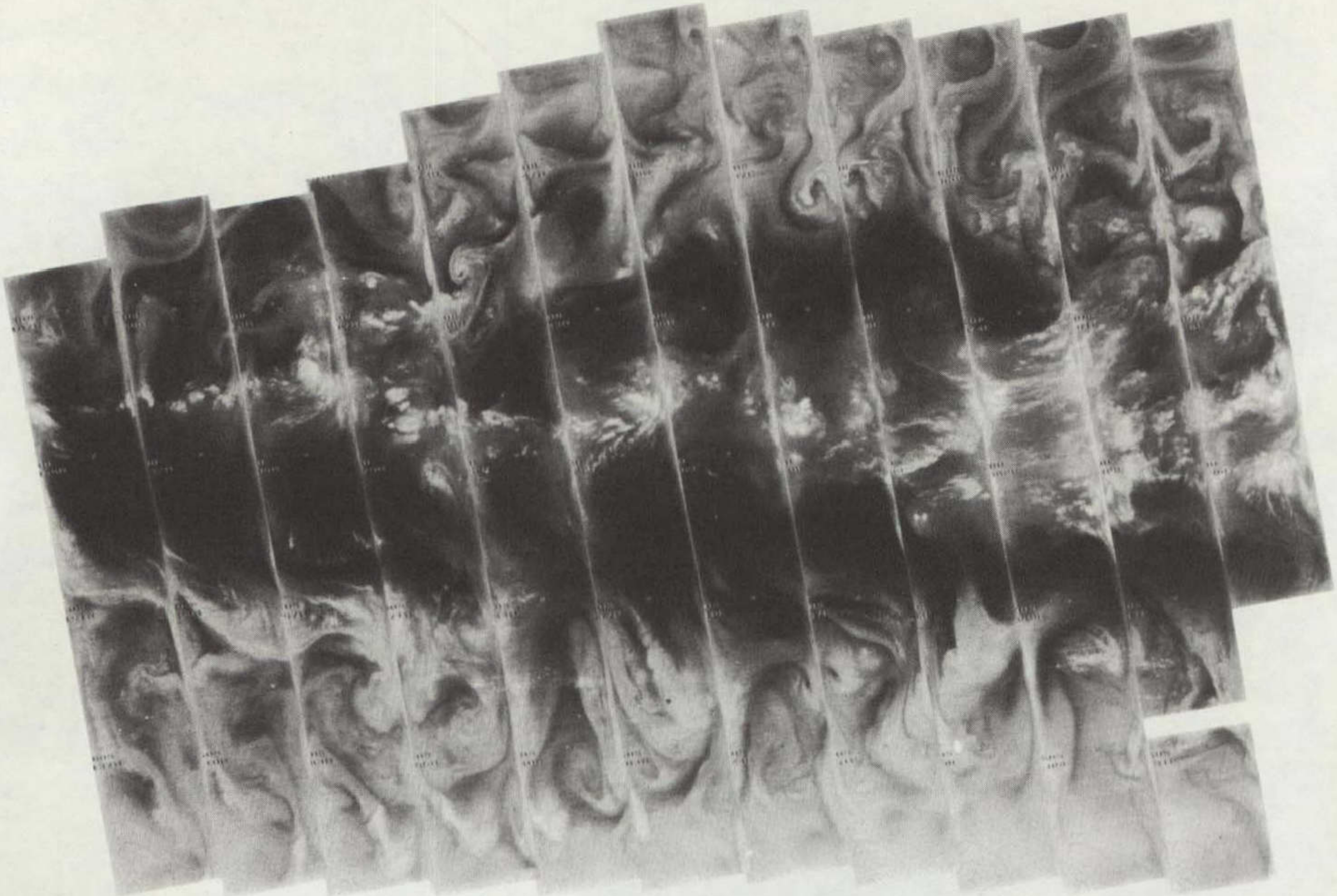
6.7 μm



599 598 597 596 595 594 593 592 591 590 589 588 587

26 JULY 1975

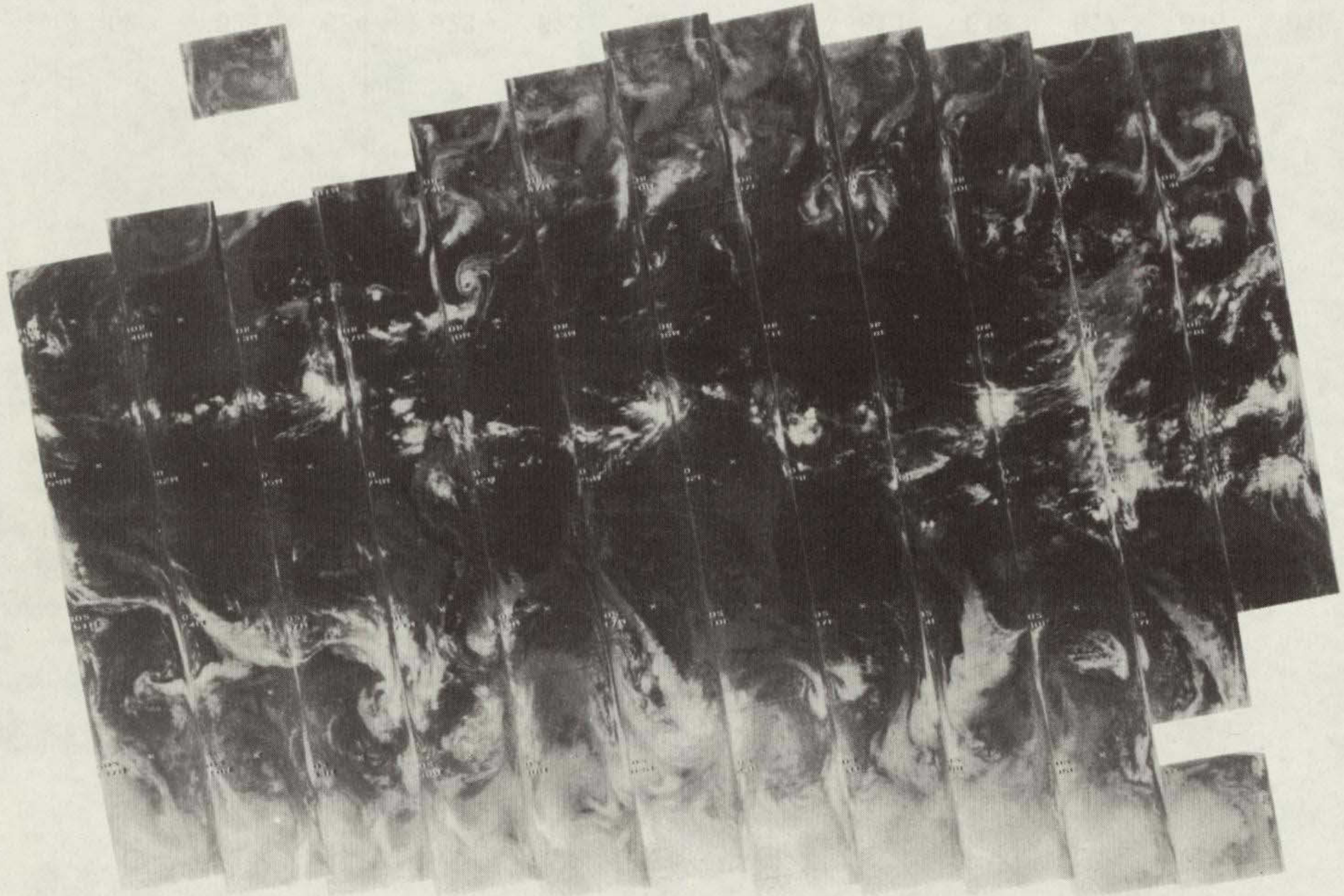
11.5 μm



612 611 610 609 608 607 606 605 604 603 602 601 600

27 JULY 1975

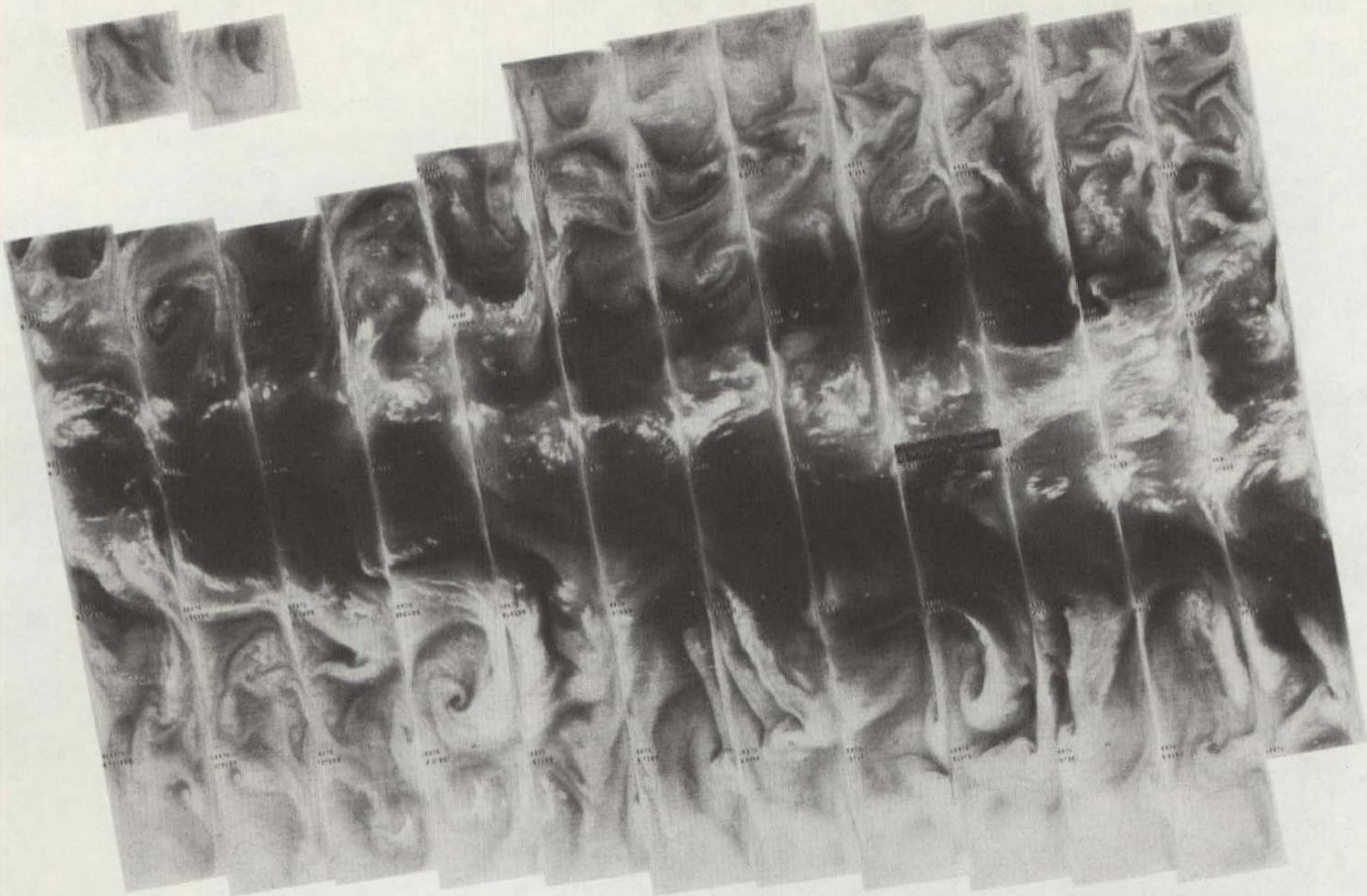
6.7 μm



612 611 610 609 608 607 606 605 604 603 602 601 600

27 JULY 1975

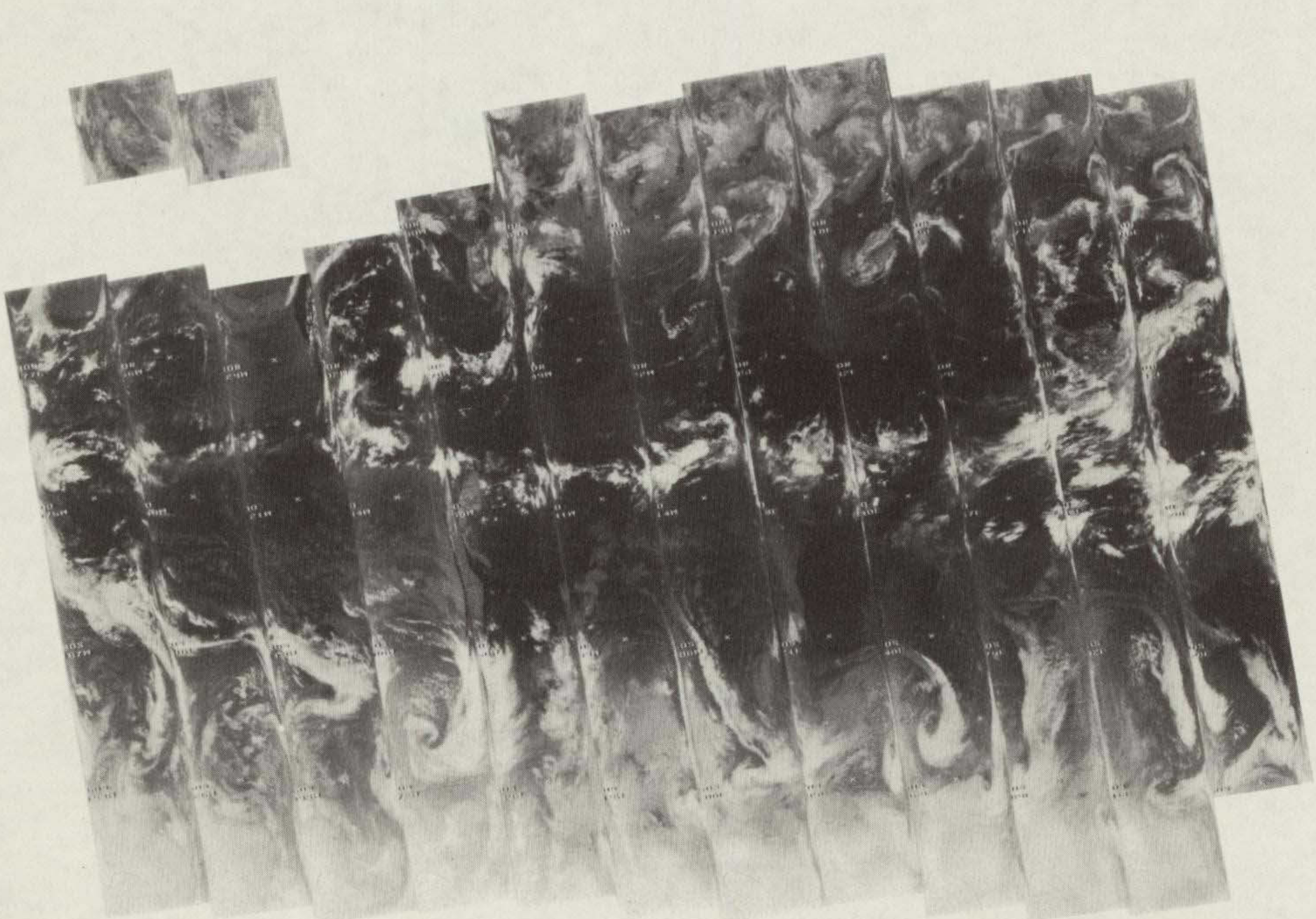
11.5 μm



626 625 624 623 622 621 620 619 618 617 616 615 614 613

28 JULY 1975

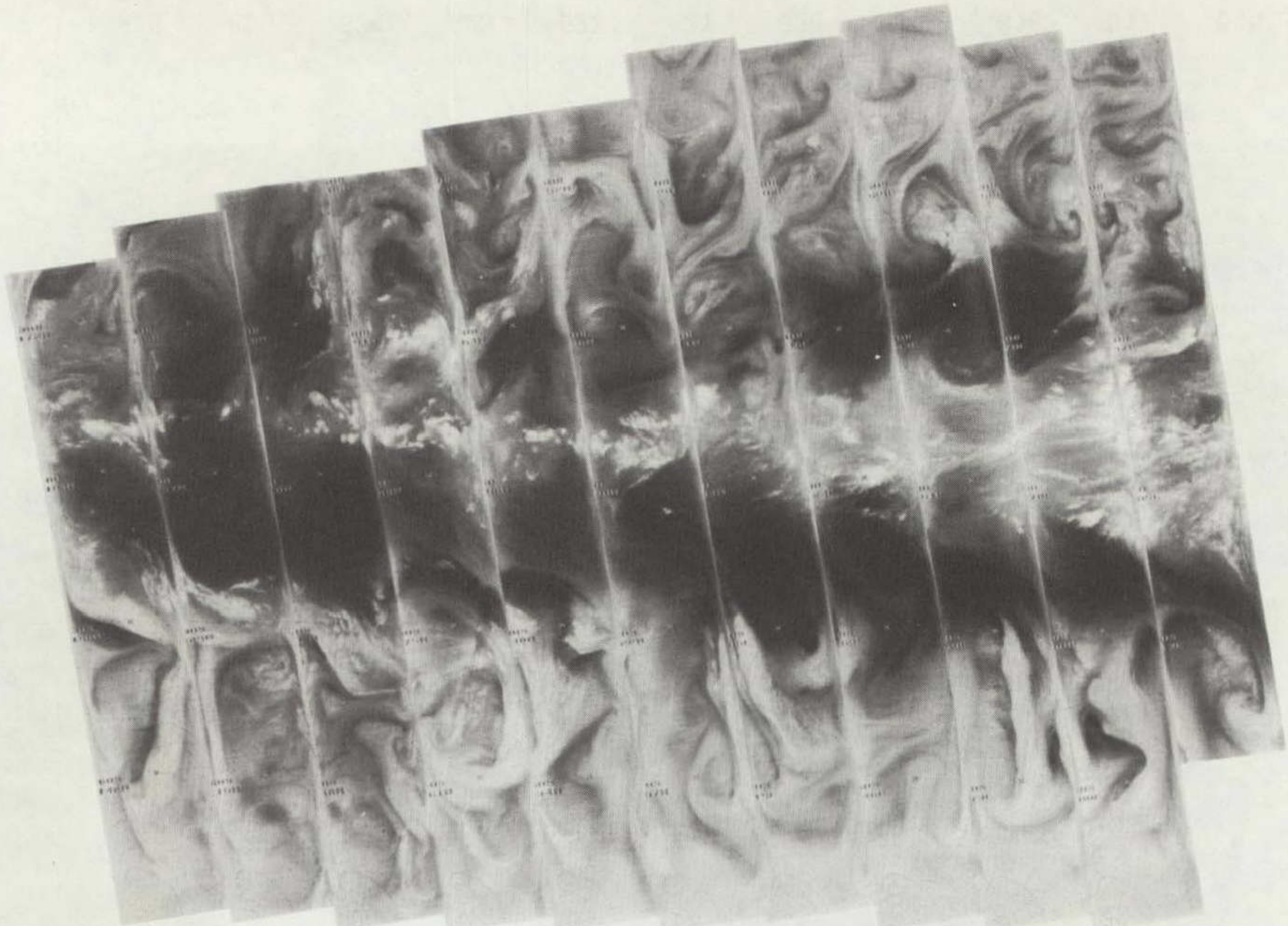
6.7 μm



626 625 624 623 622 621 620 619 618 617 616 615 614 613

28 JULY 1975

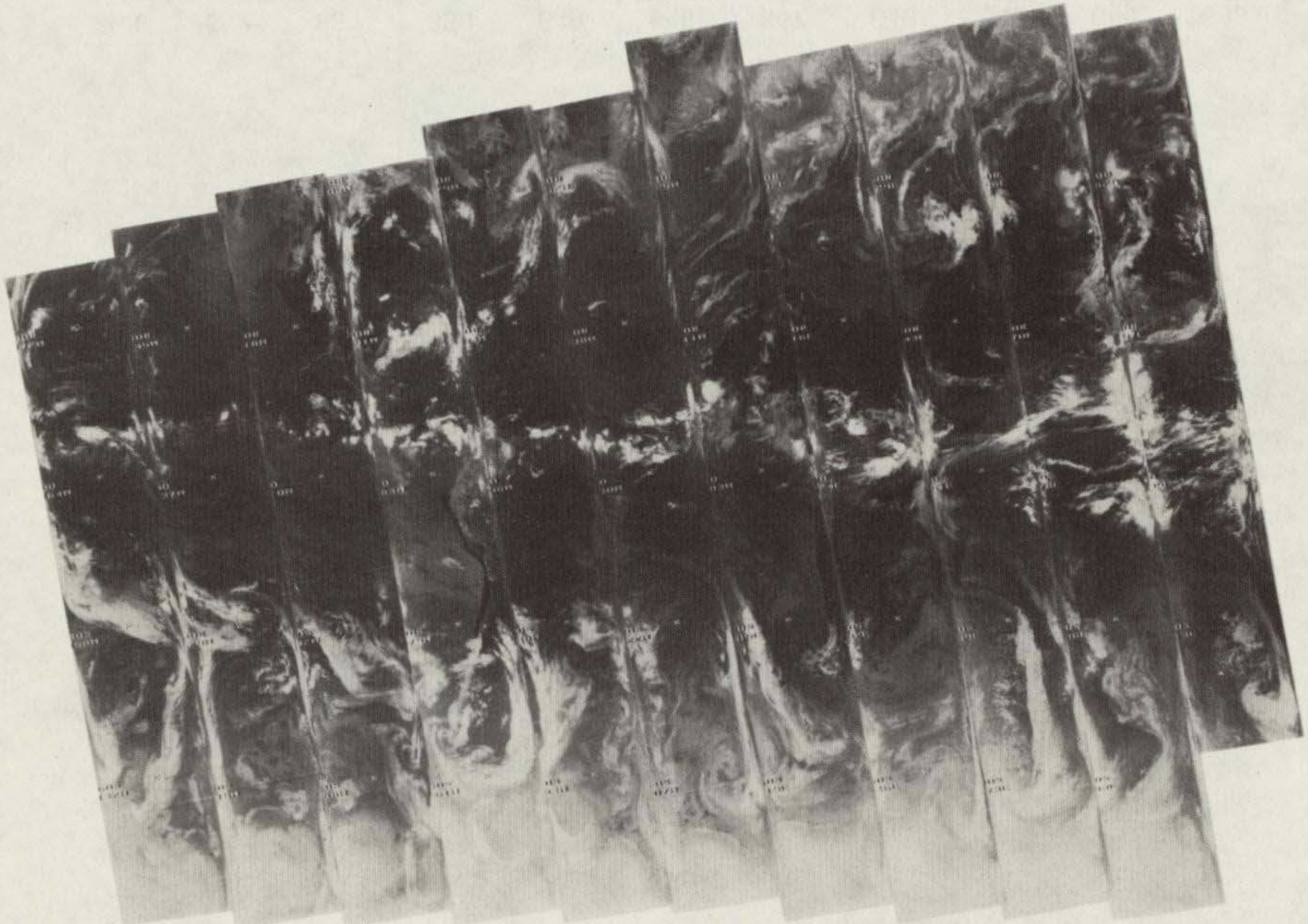
11.5 μm



639 638 637 636 635 634 633 632 631 630 629 628 627

29 JULY 1975

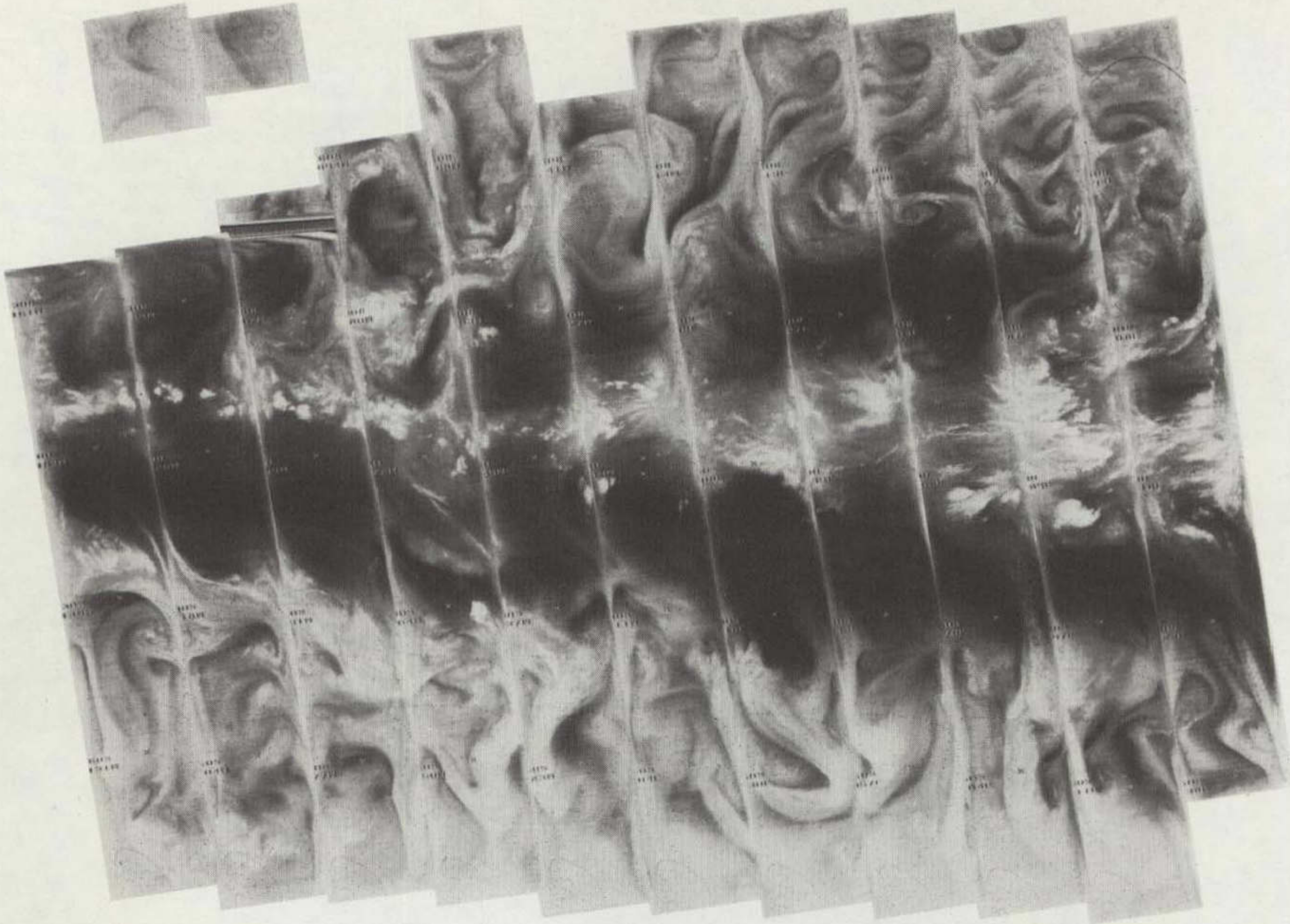
6.7 μm



639 638 637 636 635 634 633 632 631 630 629 628 627

29 JULY 1975

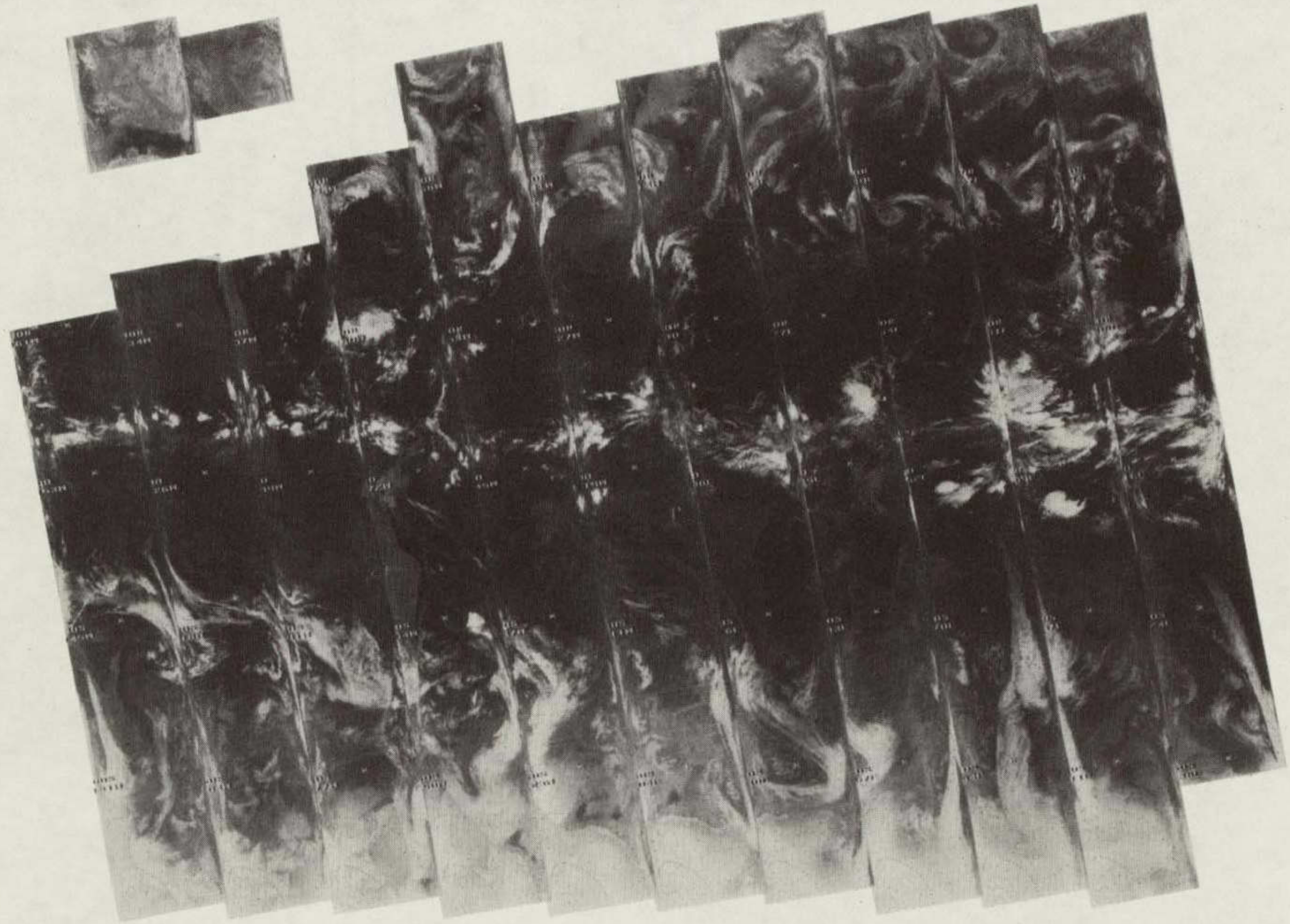
11.5 μm



653 652 651 650 649 648 647 646 645 644 643 642 641 640

30 JULY 1975

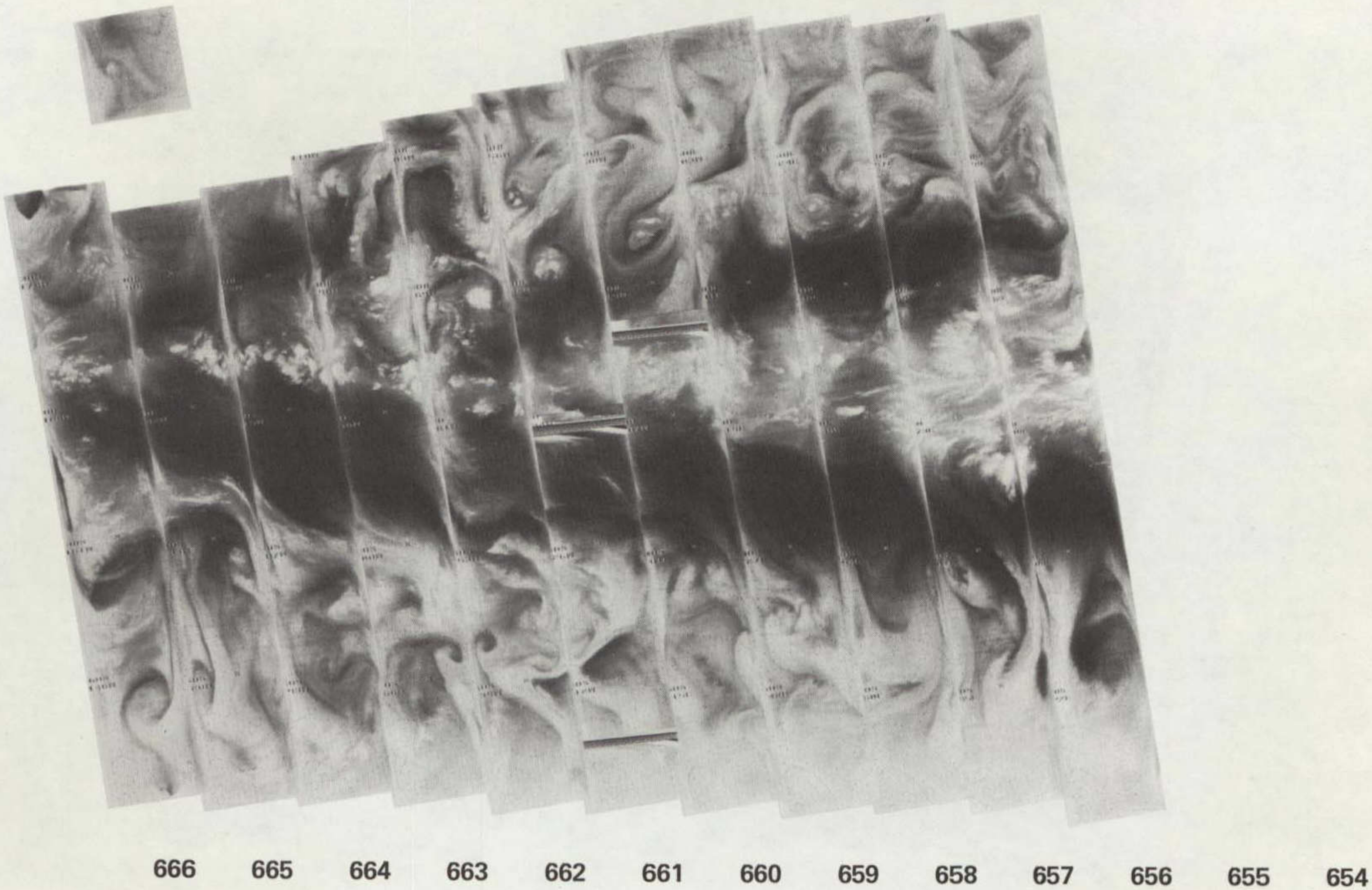
6.7 μm



653 652 651 650 649 648 647 646 645 644 643 642 641 640

30 JULY 1975

11.5 μm



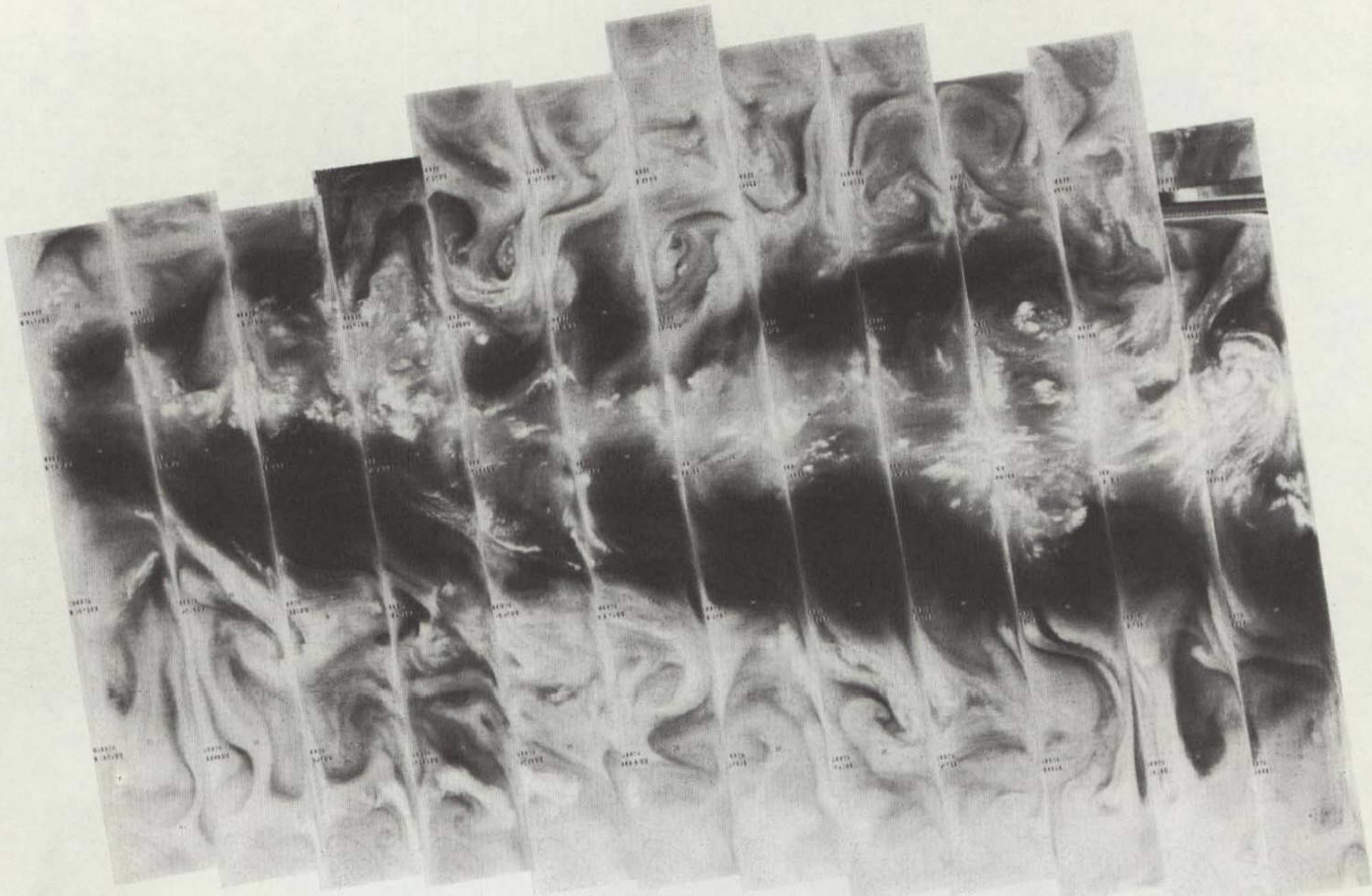
31 JULY 1975

6.7 μm

666 665 664 663 662 661 660 659 658 657 656 655 654

31 JULY 1975

11.5 μm



680 679 678 677 676 675 674 673 672 671 670 669 668 667

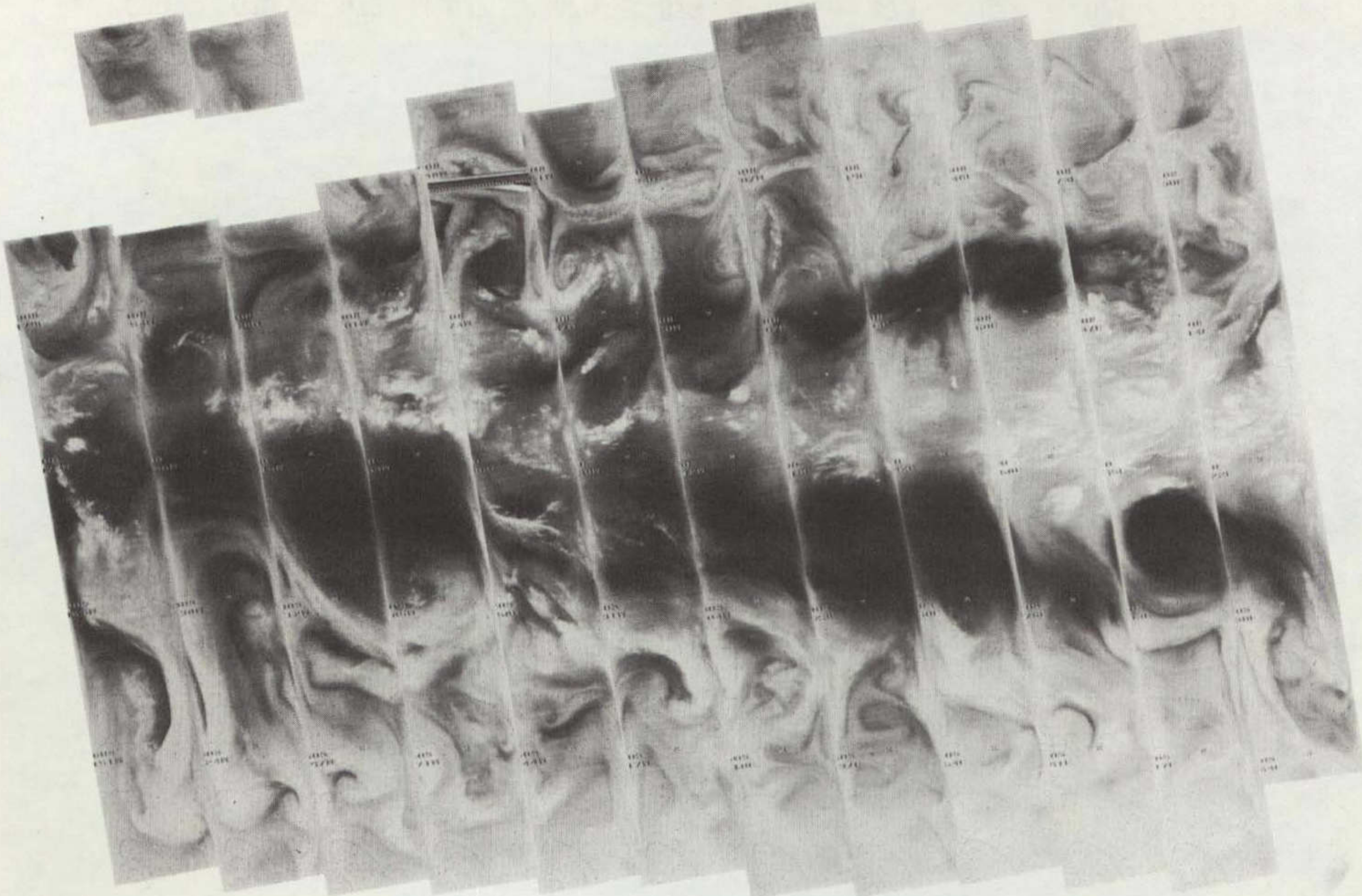
1 AUGUST 1975

6.7 μm

680 679 678 677 676 675 674 673 672 671 670 669 668 667

1 AUGUST 1975

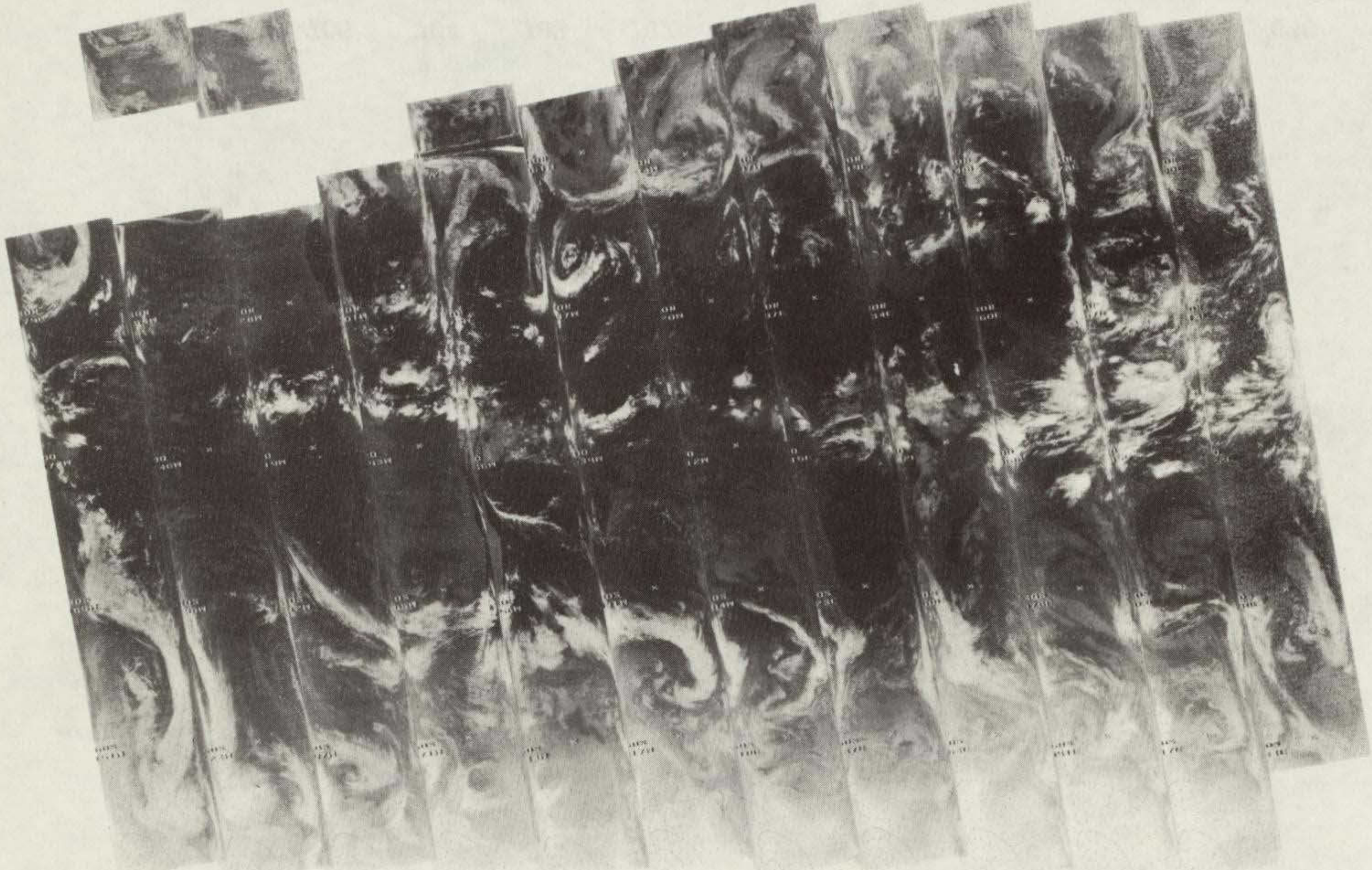
11.5 μm



693 692 691 690 689 688 687 686 685 684 683 682 681

2 AUGUST 1975

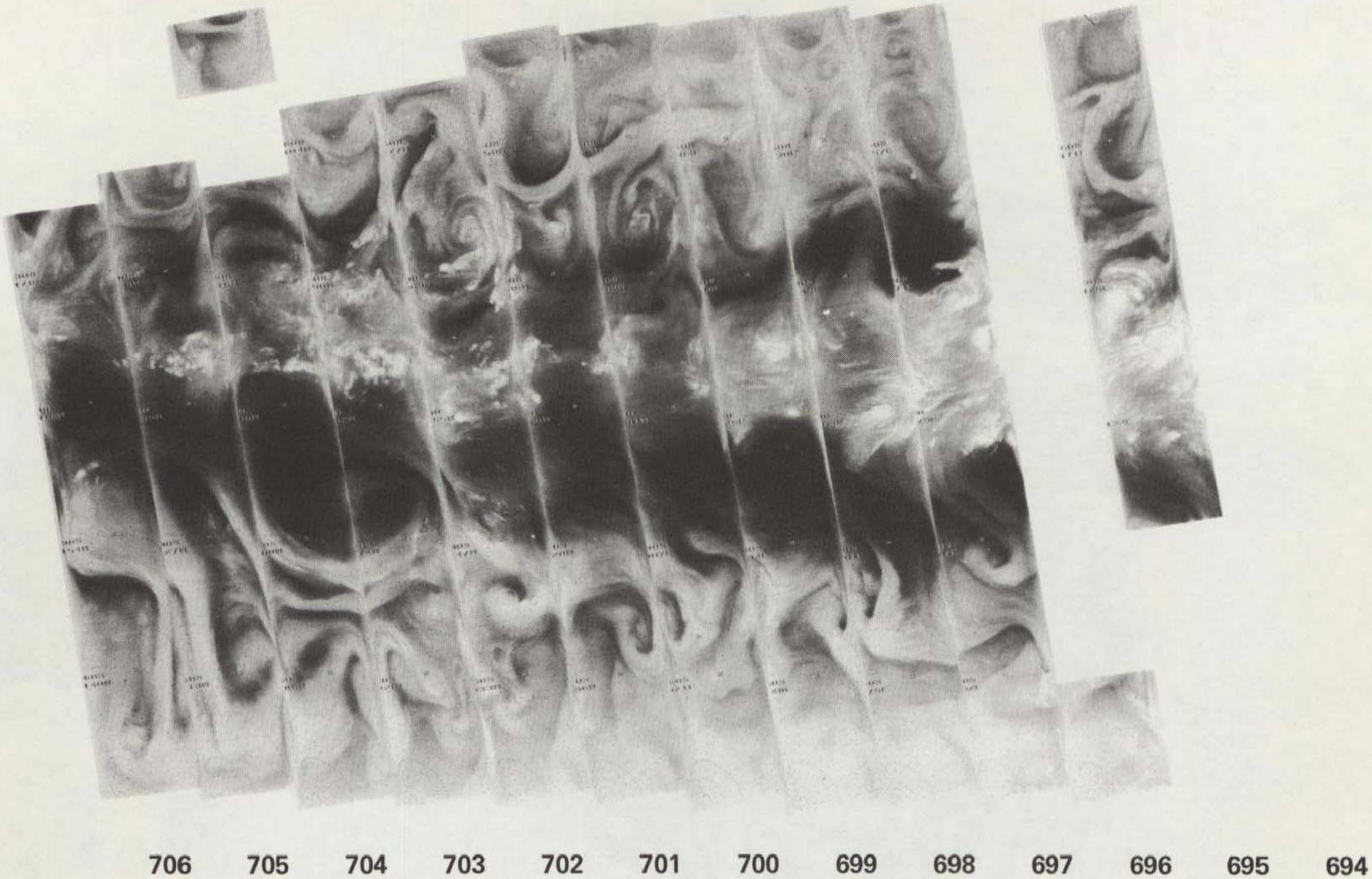
6.7 μm



693 692 691 690 689 688 687 686 685 684 683 682 681

2 AUGUST 1975

11.5 μm



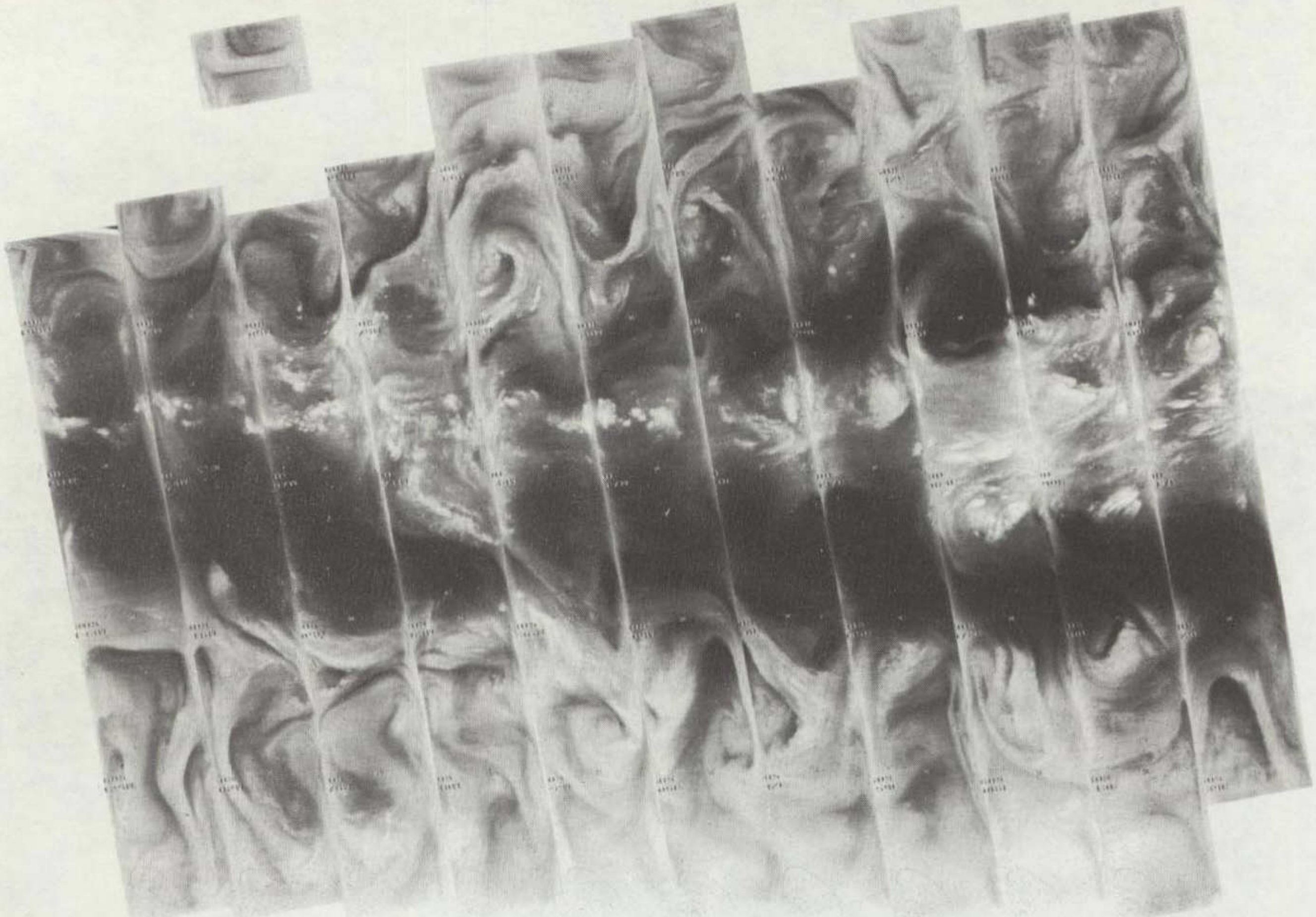
3 AUGUST 1975

6.7 μm

706 705 704 703 702 701 700 699 698 697 696 695 694

3 AUGUST 1975

11.5 μm



720 719 718 717 716 715 714 713 712 711 710 709 708 707

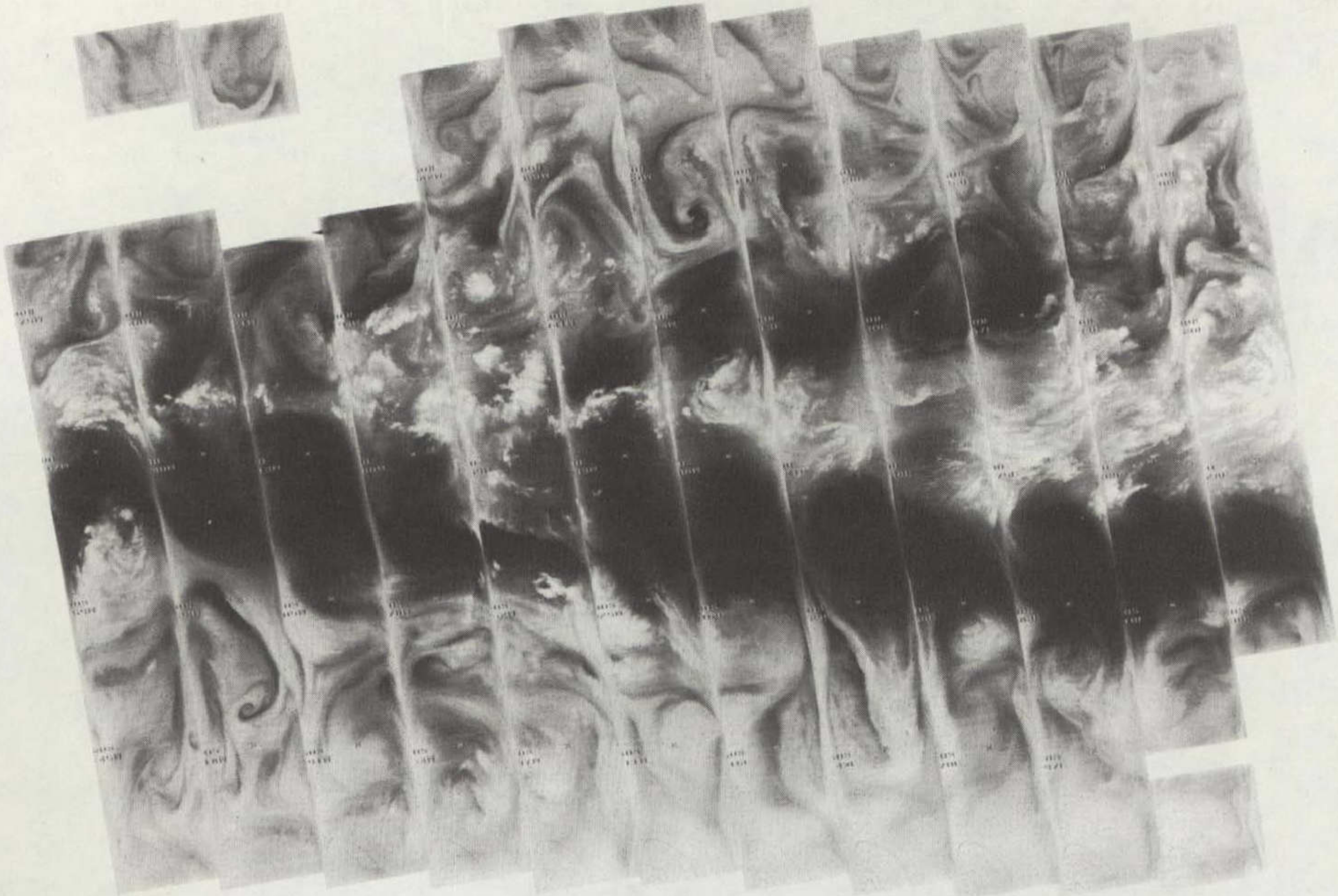
4 AUGUST 1975

6.7 μm

720 719 718 717 716 715 714 713 712 711 710 709 708 707

4 AUGUST 1975

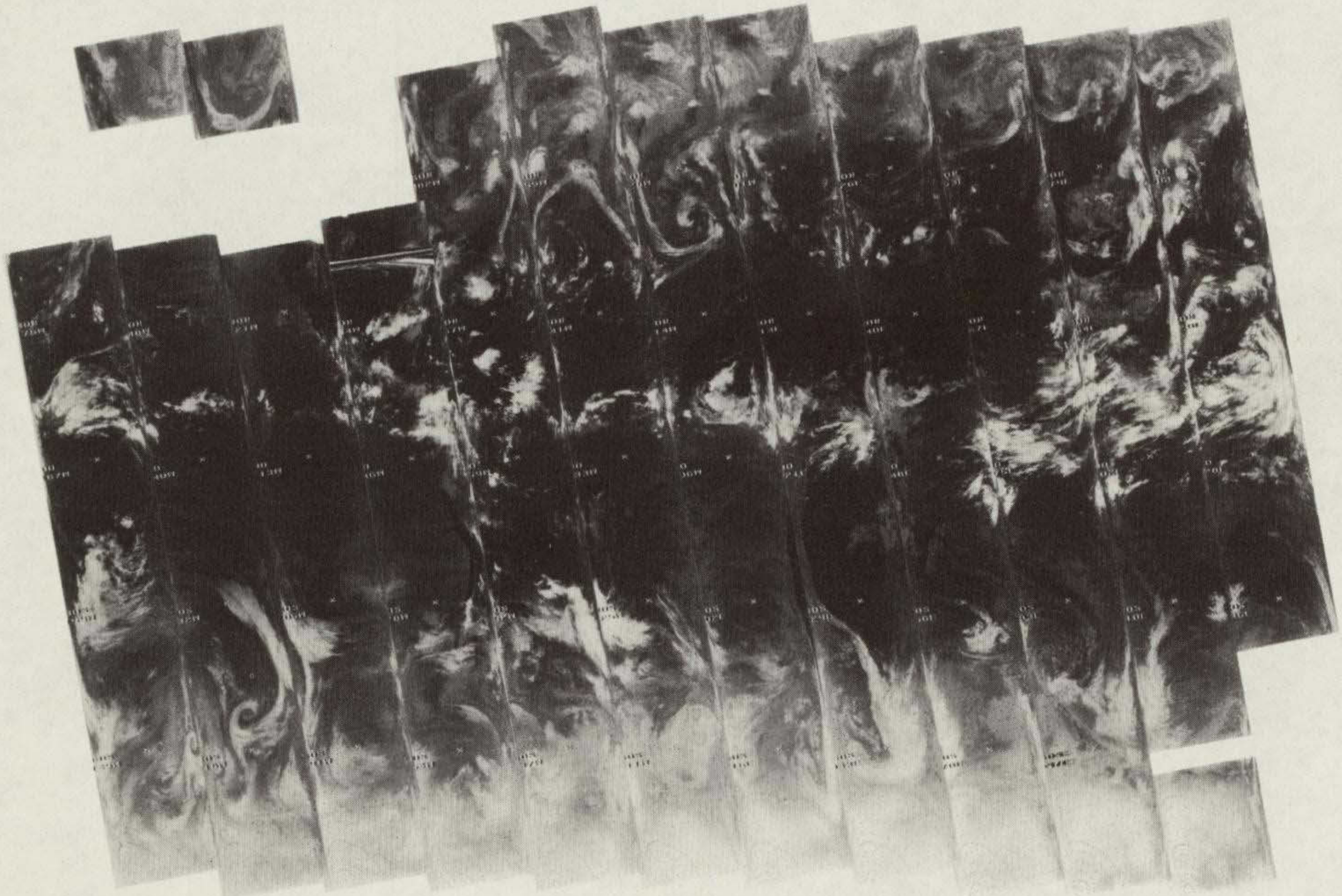
11.5 μm



733 732 731 730 729 728 727 726 725 724 723 722 721

5 AUGUST 1975

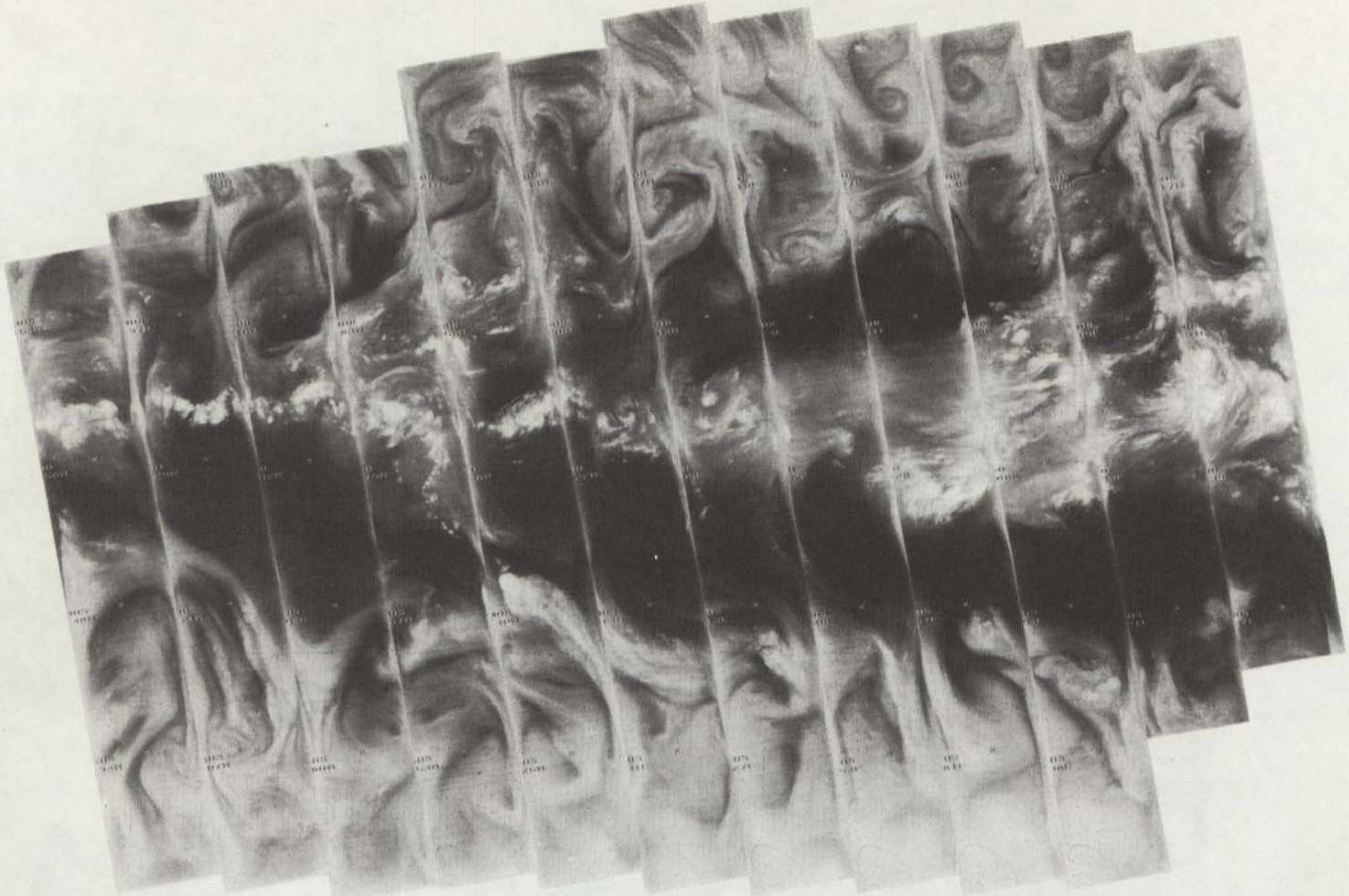
6.7 μm



733 732 731 730 729 728 727 726 725 724 723 722 721

5 AUGUST 1975

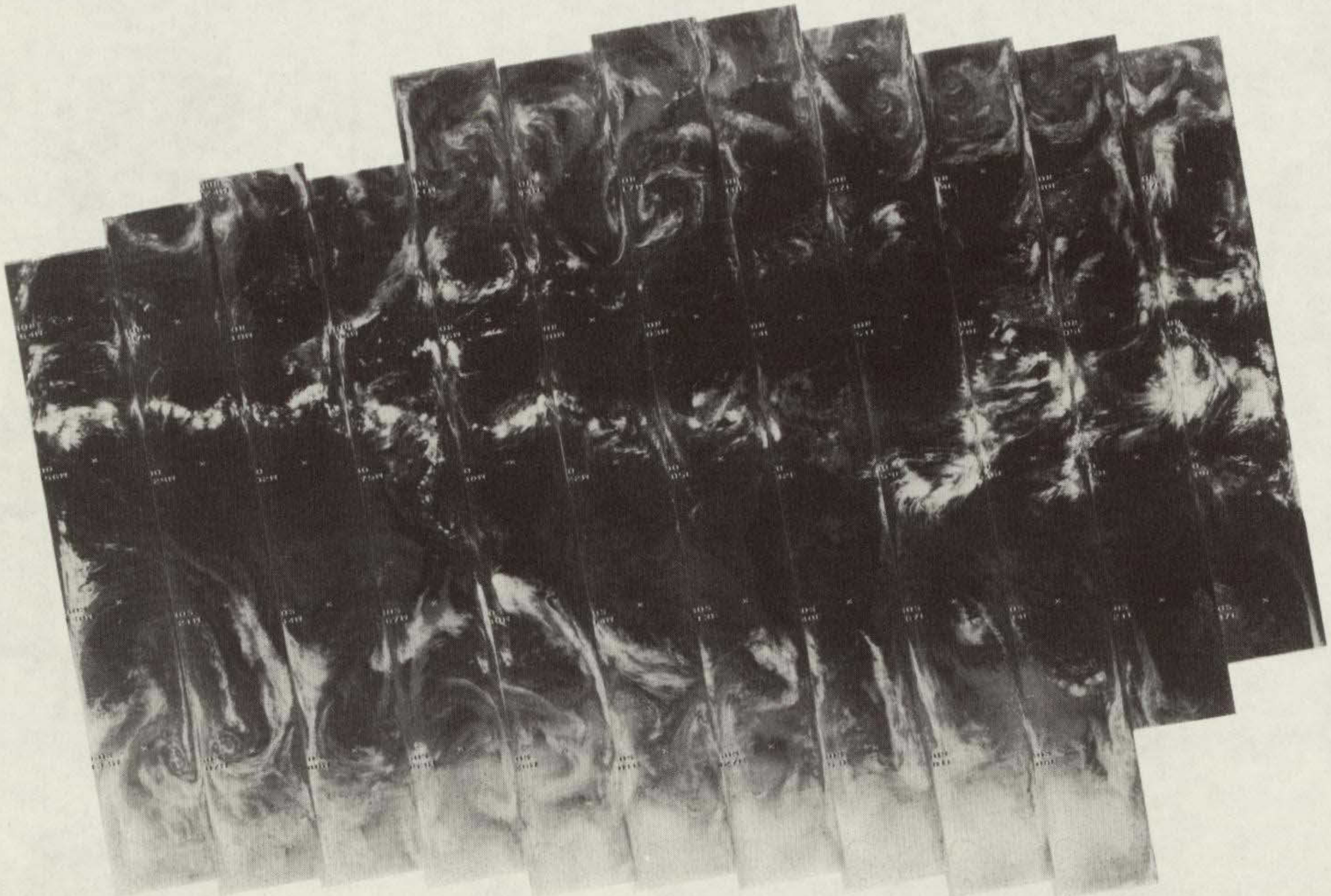
11.5 μm



747 746 745 744 743 742 741 740 739 738 737 736 735 734

6 AUGUST 1975

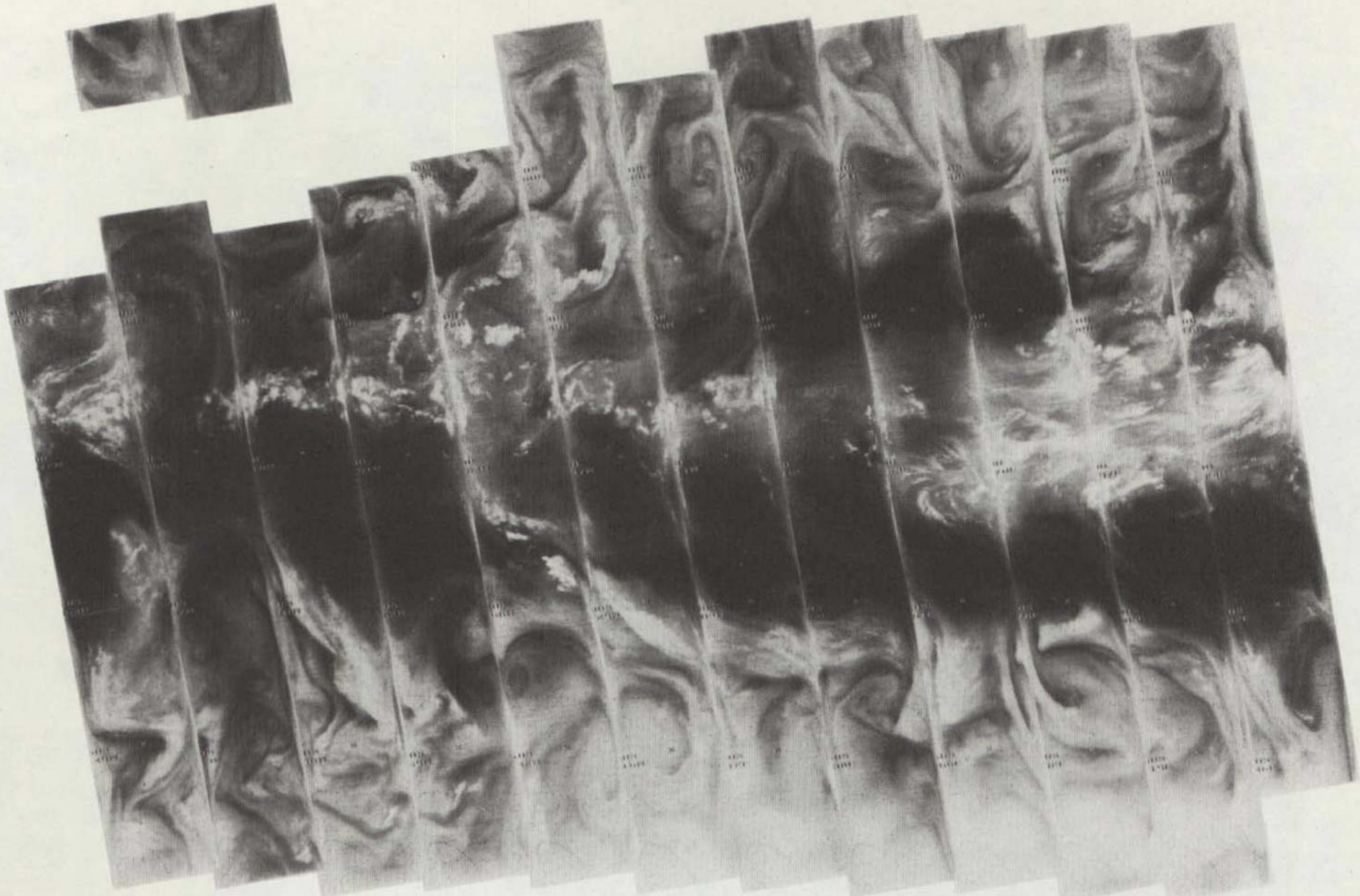
6.7 μm



747 746 745 744 743 742 741 740 739 738 737 736 735 734

6 AUGUST 1975

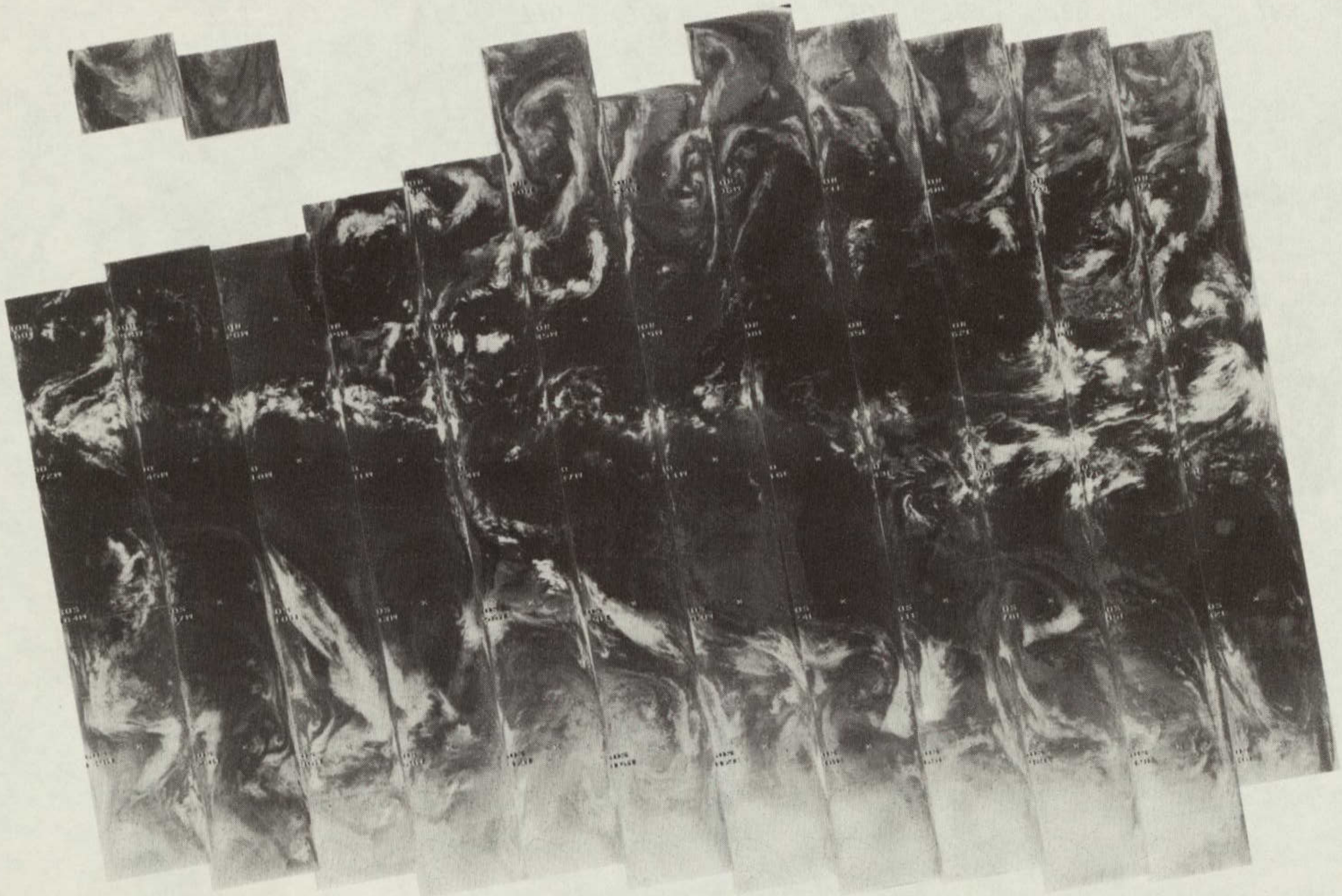
11.5 μm



760 759 758 757 756 755 754 753 752 751 750 749 748

7 AUGUST 1975

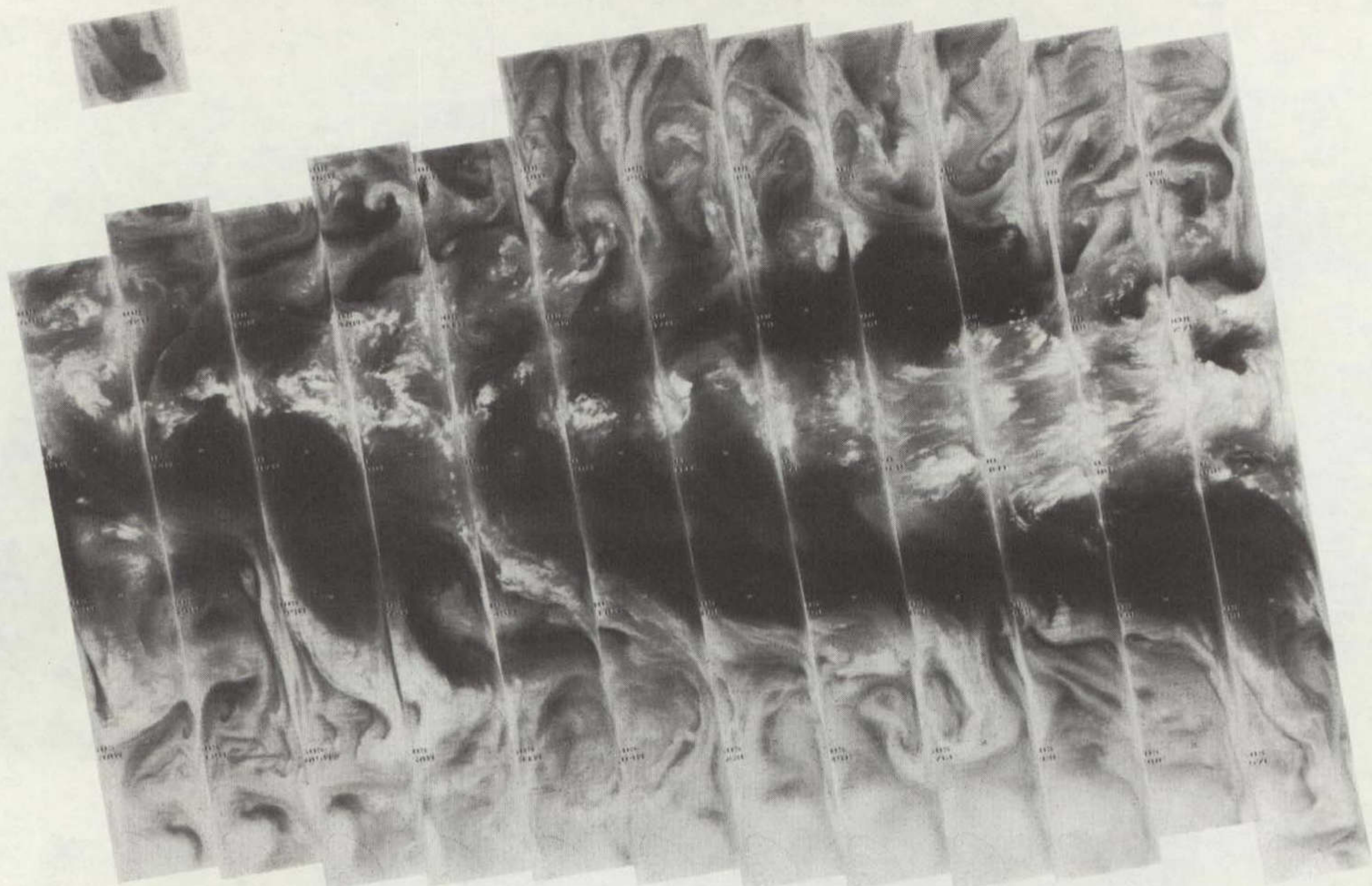
6.7 μm



760 759 758 757 756 755 754 753 752 751 750 749 748

7 AUGUST 1975

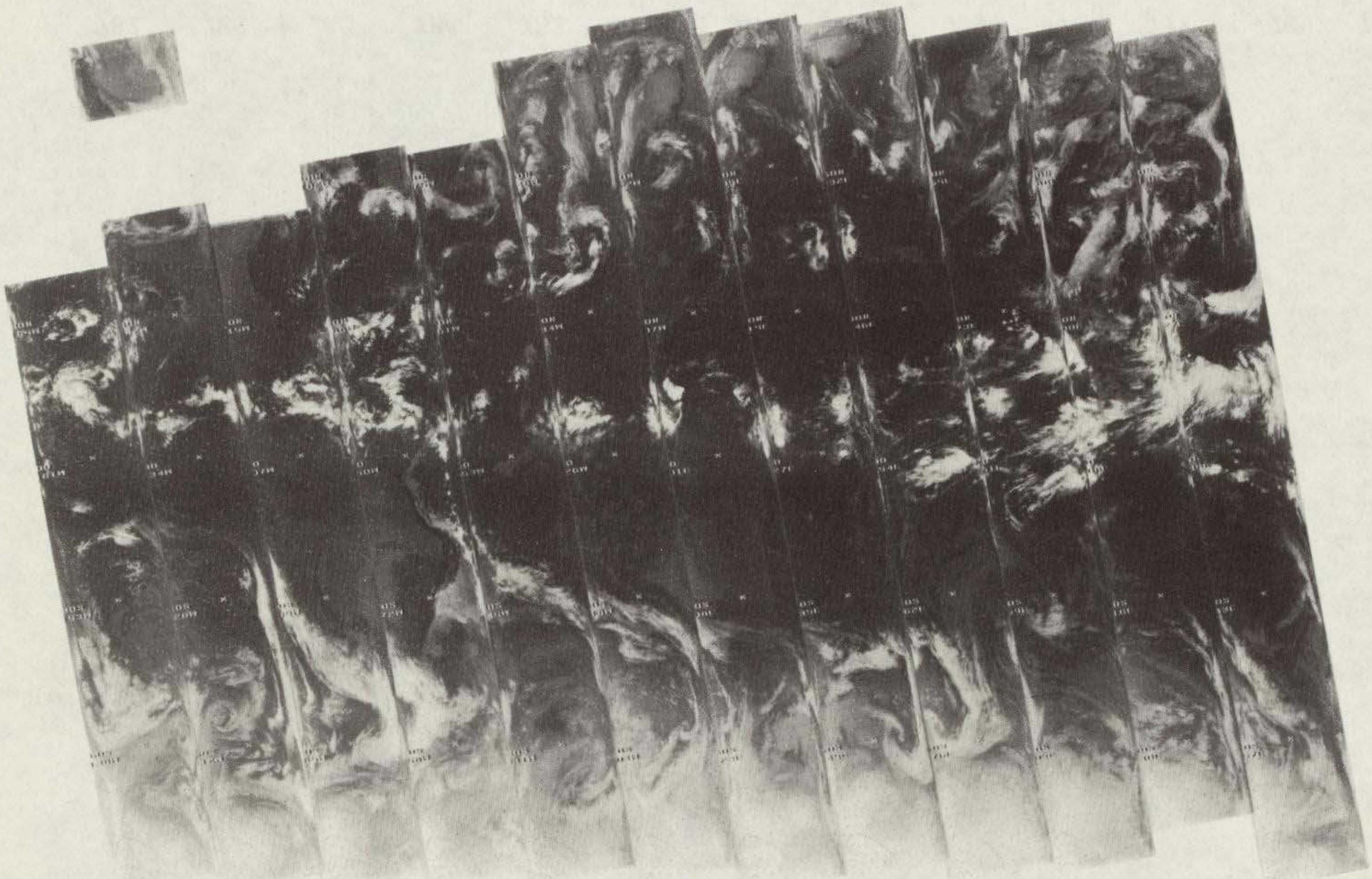
11.5 μm



773 772 771 770 769 768 767 766 765 764 763 762 761

8 AUGUST 1975

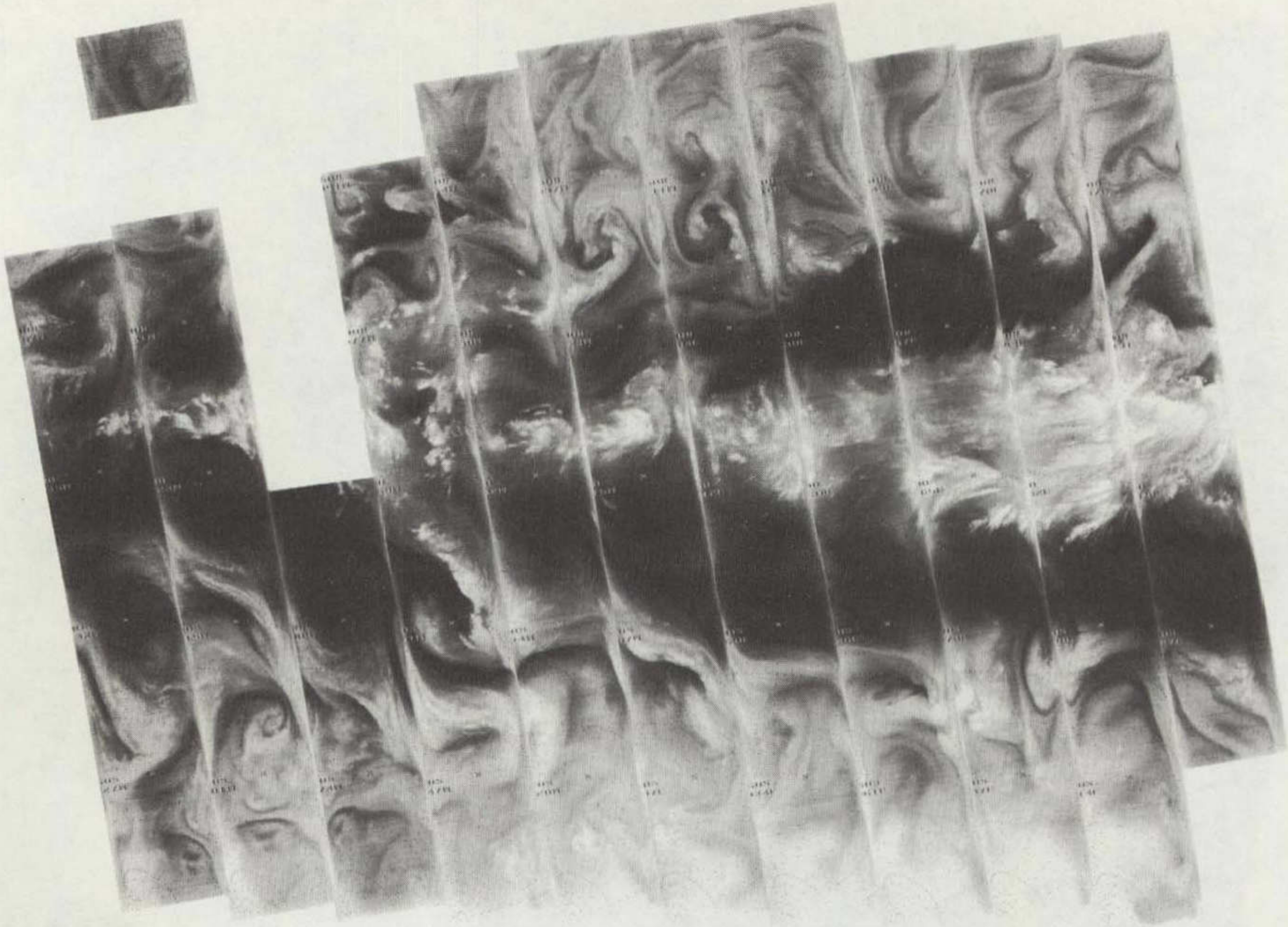
6.7 μm



773 772 771 770 769 768 767 766 765 764 763 762 761

8 AUGUST 1975

11.5 μm



787 786 785 784 783 782 781 780 779 778 777 776 775 774

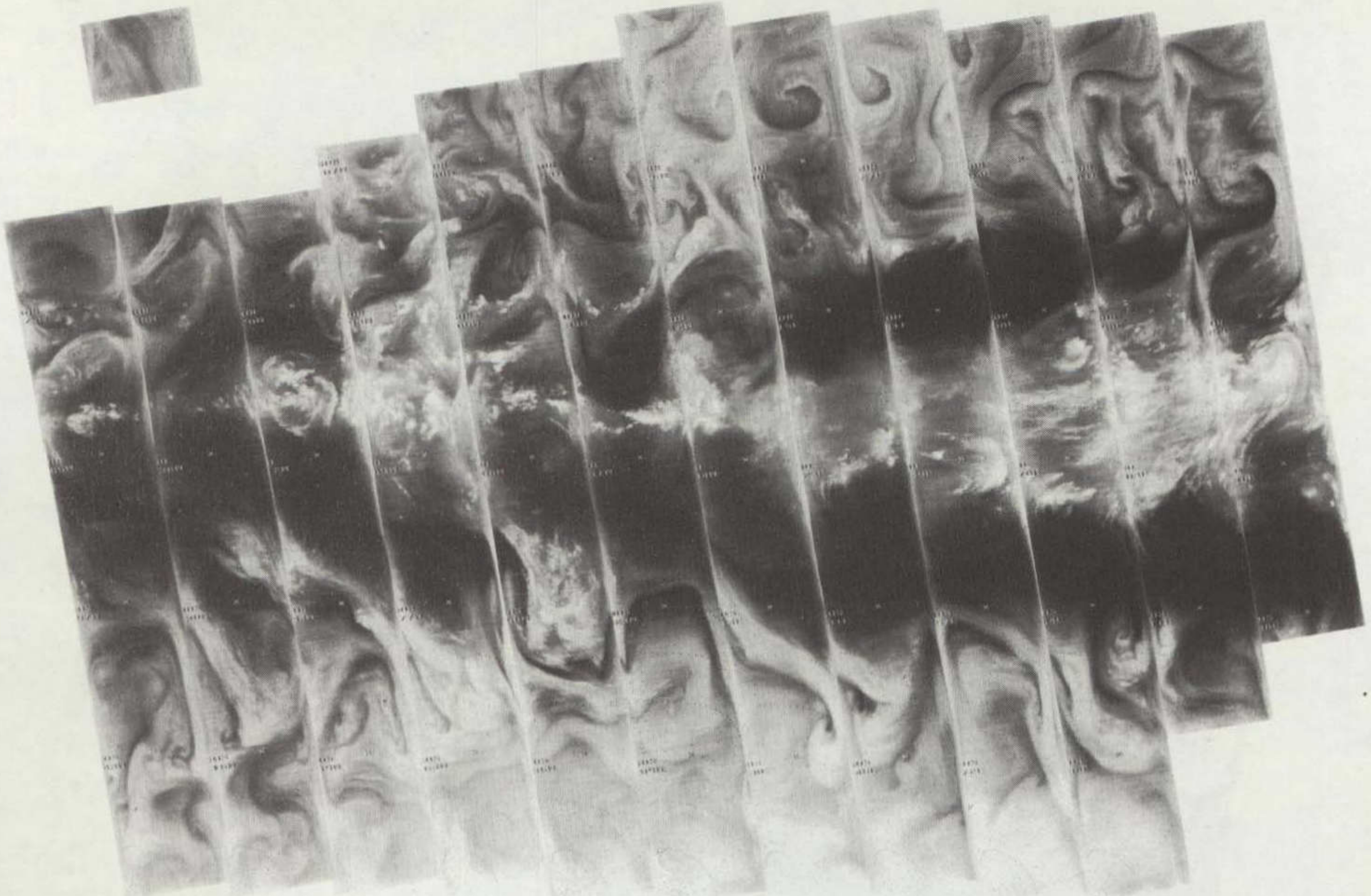
9 AUGUST 1975

6.7 μm

787 786 785 784 783 782 781 780 779 778 777 776 775 774

9 AUGUST 1975

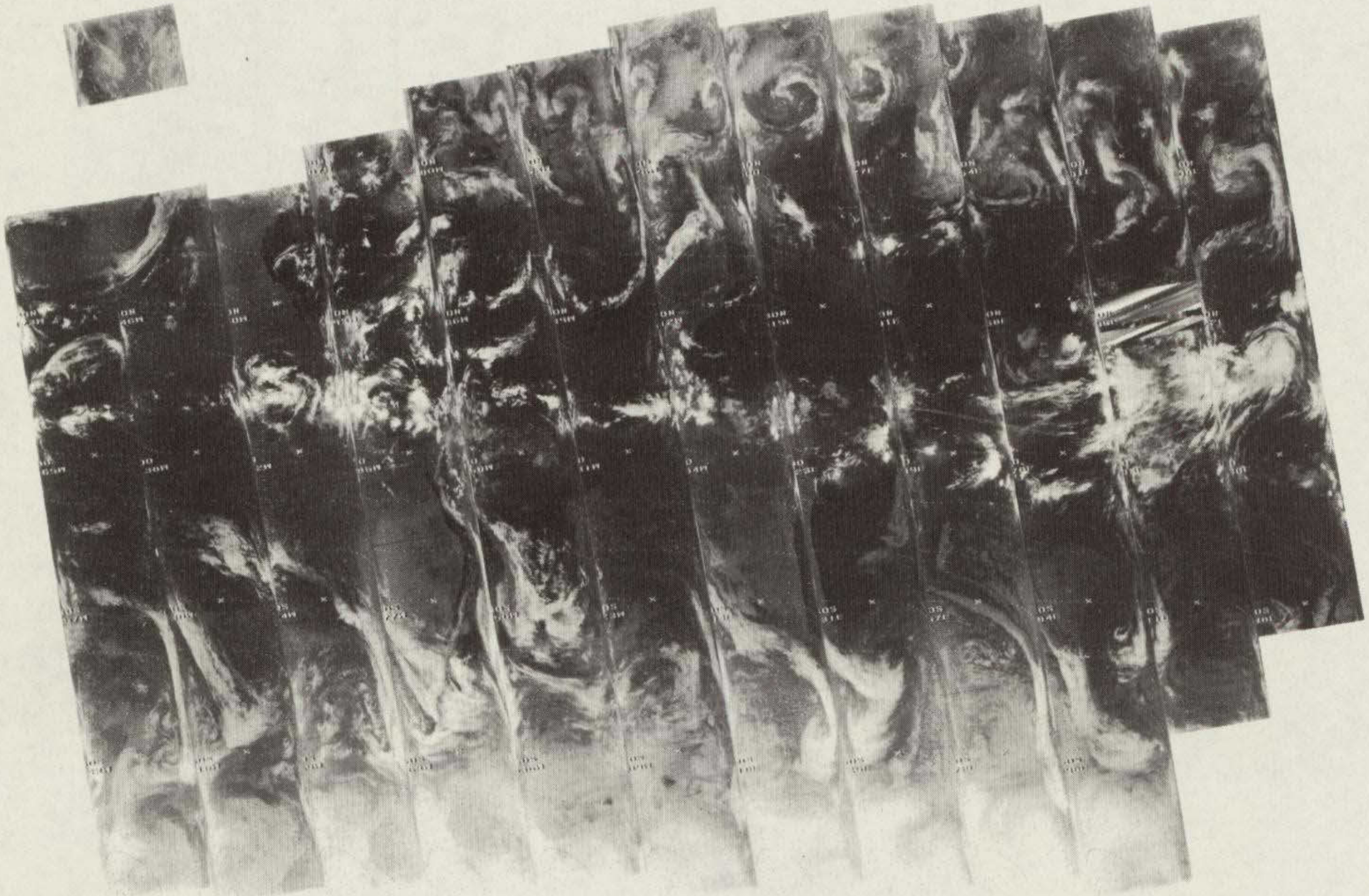
11.5 μm



800 799 798 797 796 795 794 793 792 791 790 789 788

10 AUGUST 1975

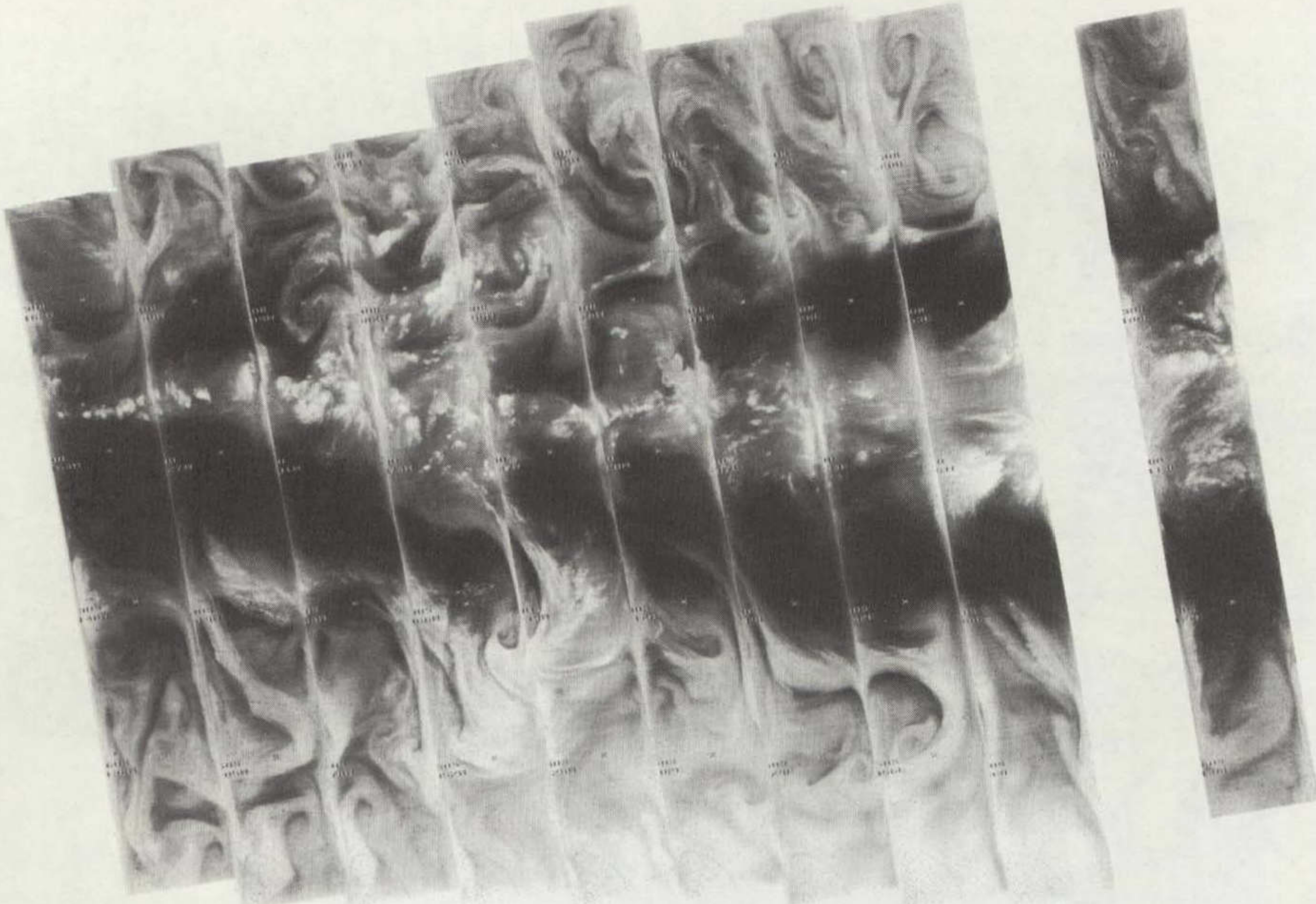
6.7 μm



800 799 798 797 796 795 794 793 792 791 790 789 788

10 AUGUST 1975

11.5 μm



814 813 812 811 810 809 808 807 806 805 804 803 802 801

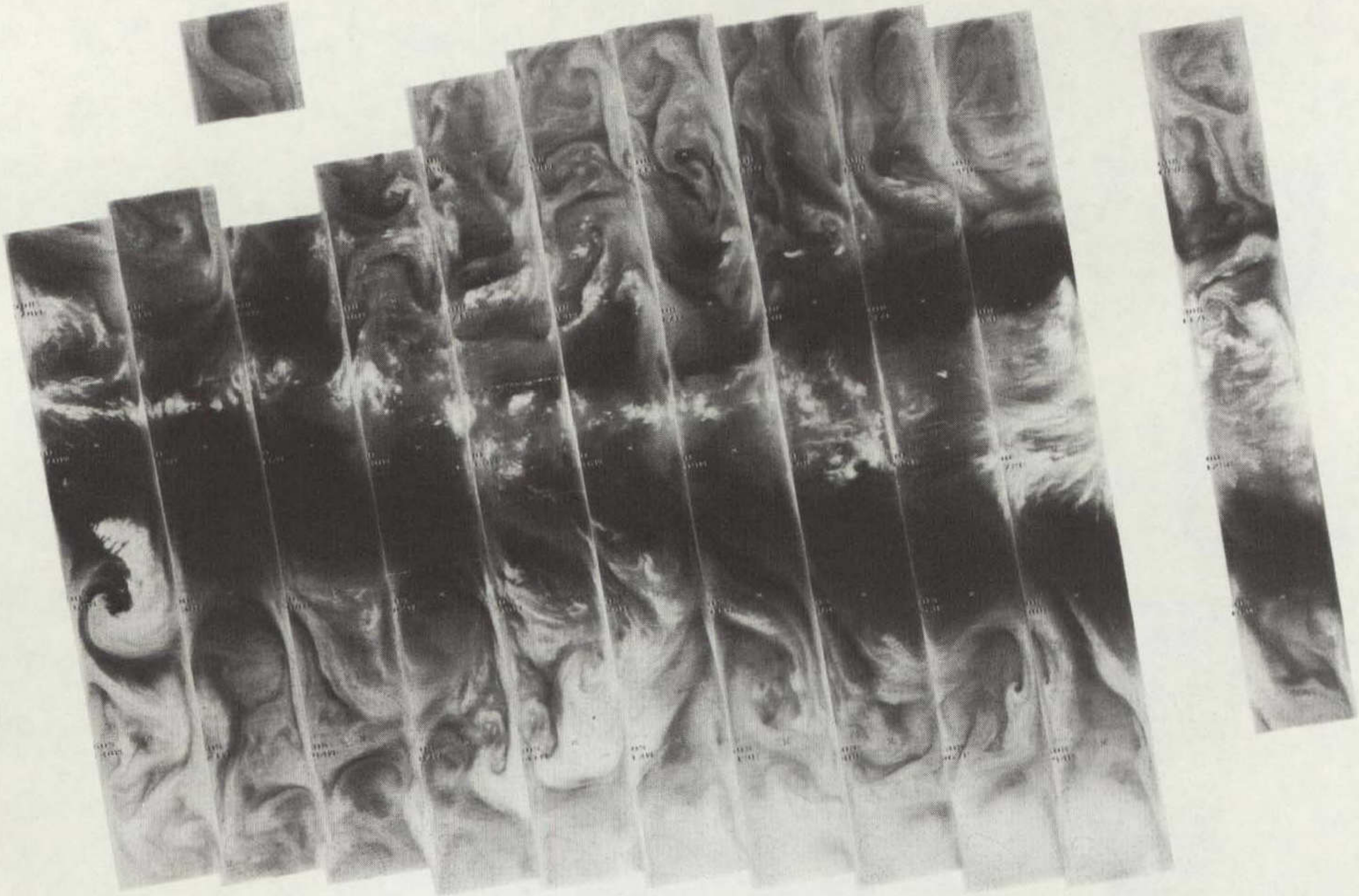
11 AUGUST 1975

6.7 μm

814 813 812 811 810 809 808 807 806 805 804 803 802 801

11 AUGUST 1975

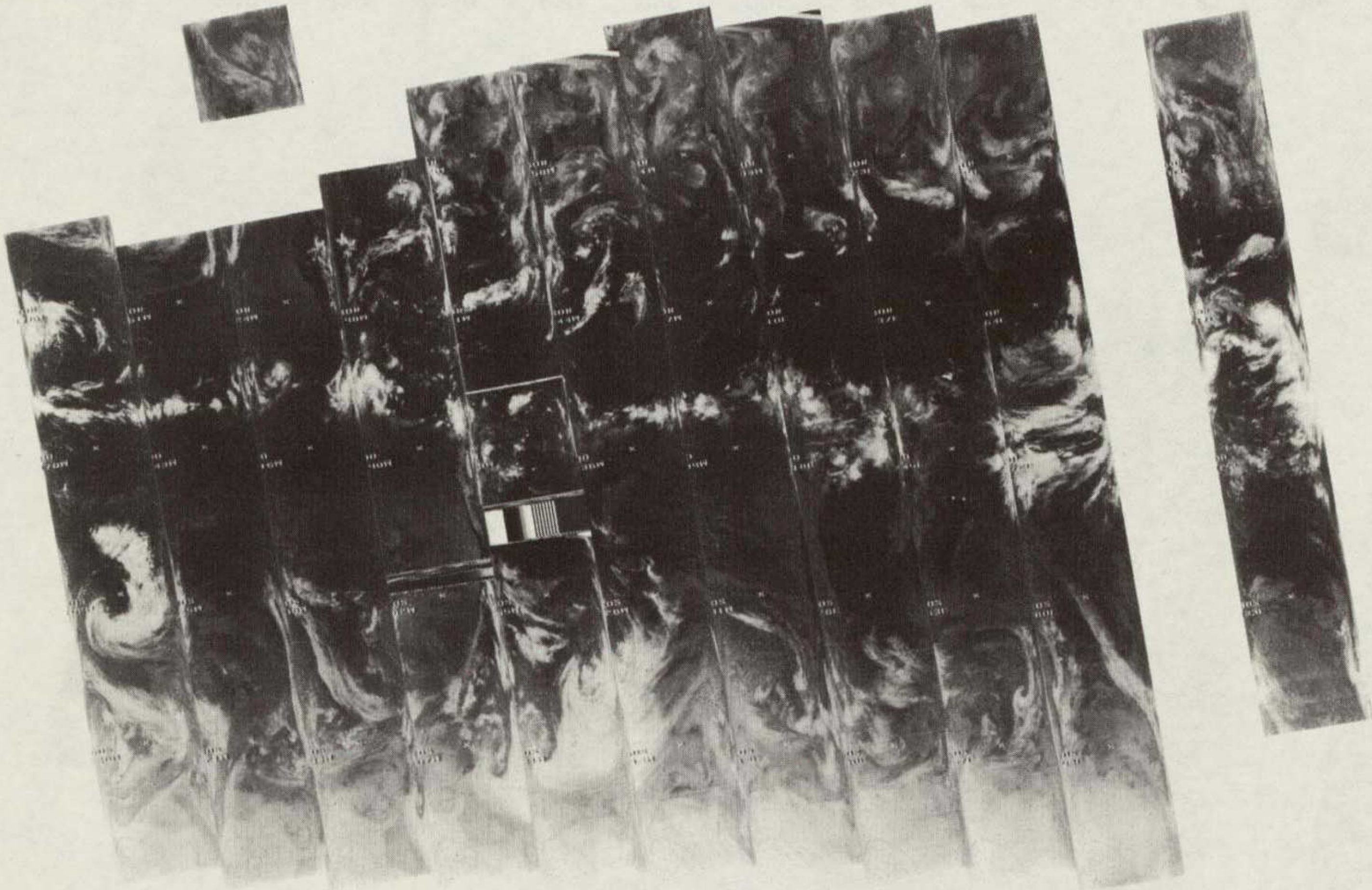
11.5 μm



827 826 825 824 823 822 821 820 819 818 817 816 815

12 AUGUST 1975

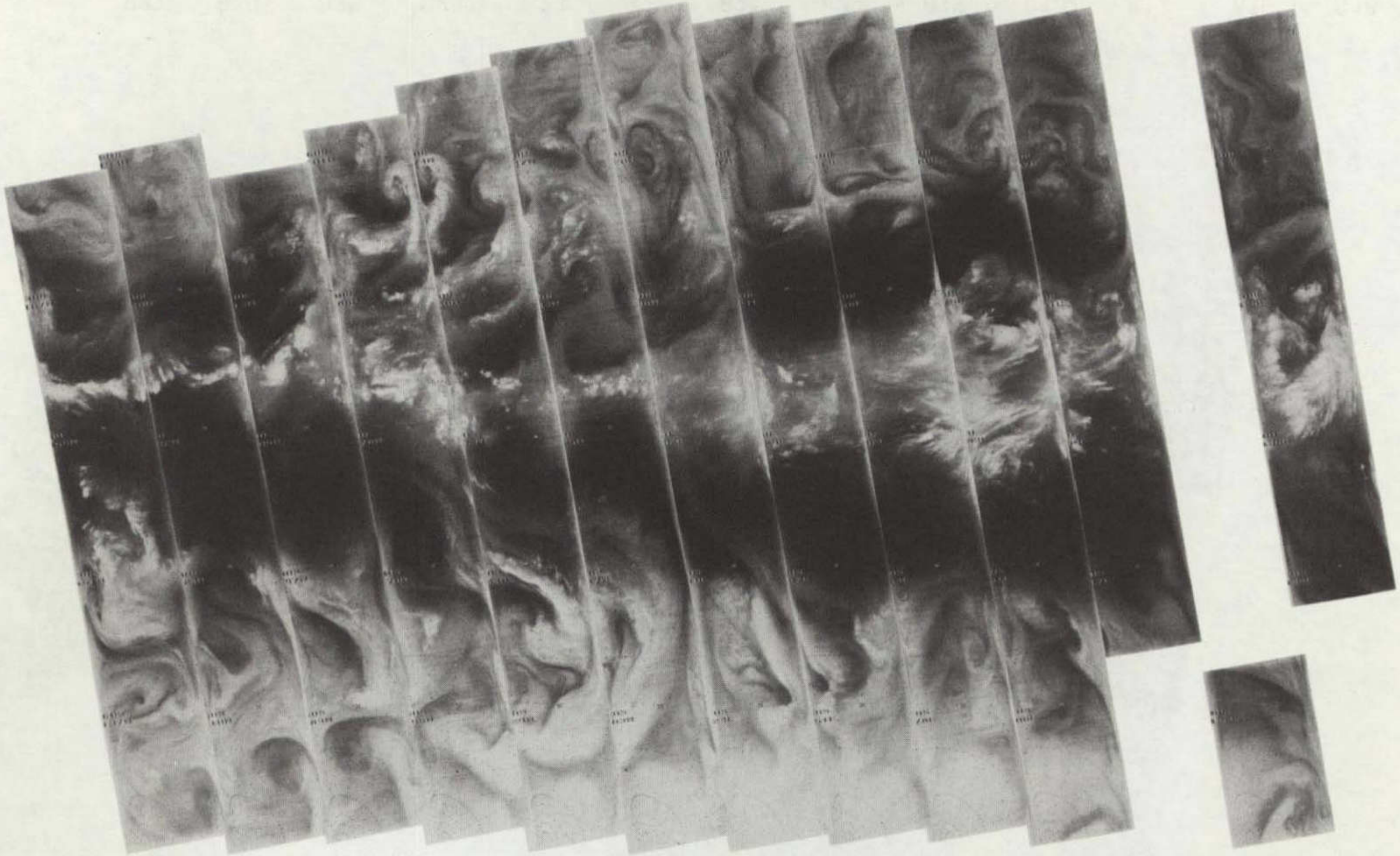
6.7 μm



827 826 825 824 823 822 821 820 819 818 817 816 815

12 AUGUST 1975

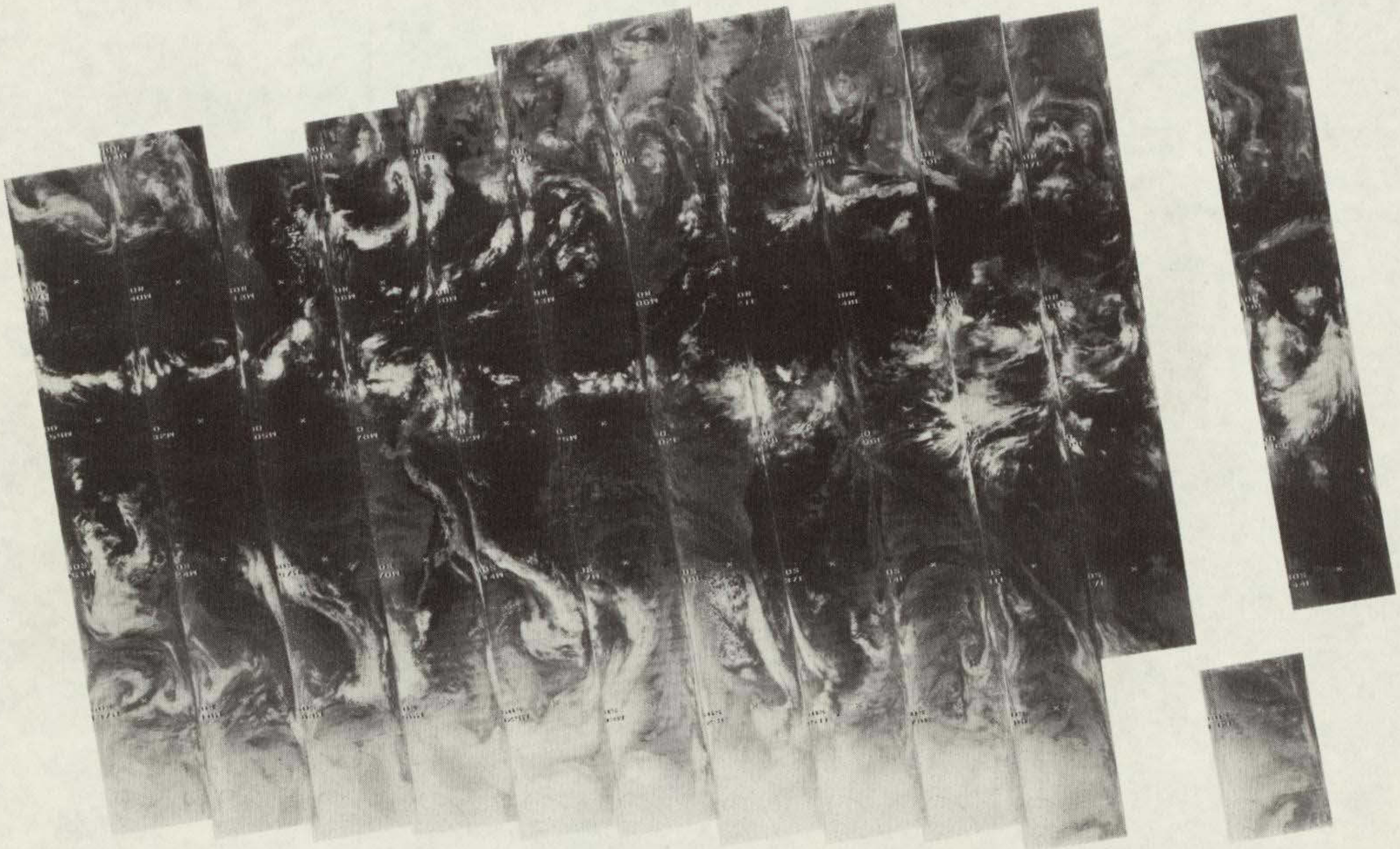
11.5 μm



840 839 838 837 836 835 834 833 832 831 830 829 828

13 AUGUST 1975

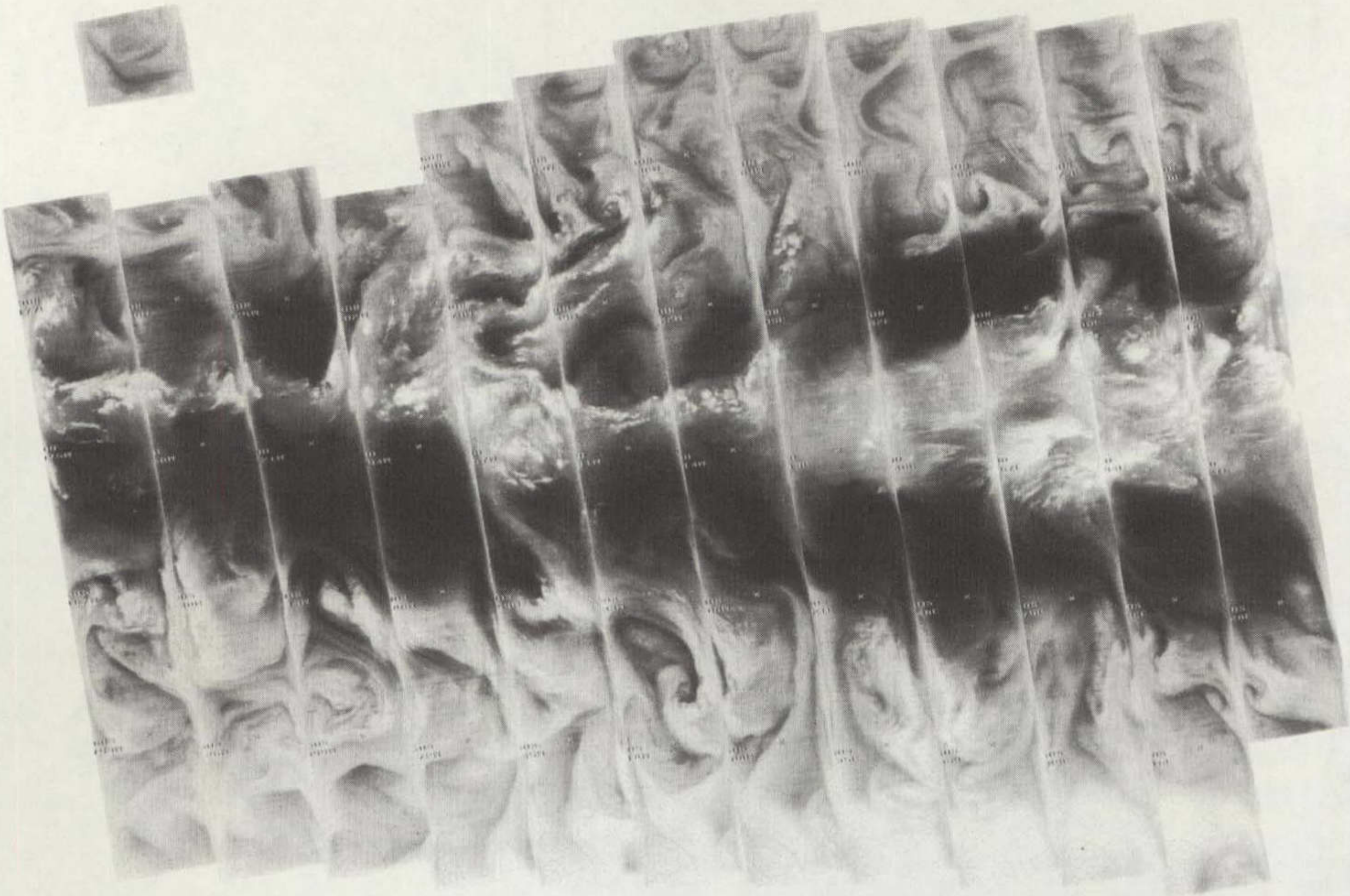
6.7 μm



840 839 838 837 836 835 834 833 832 831 830 829 828

13 AUGUST 1975

11.5 μm



854 853 852 851 850 849 848 847 846 845 844 843 842 841

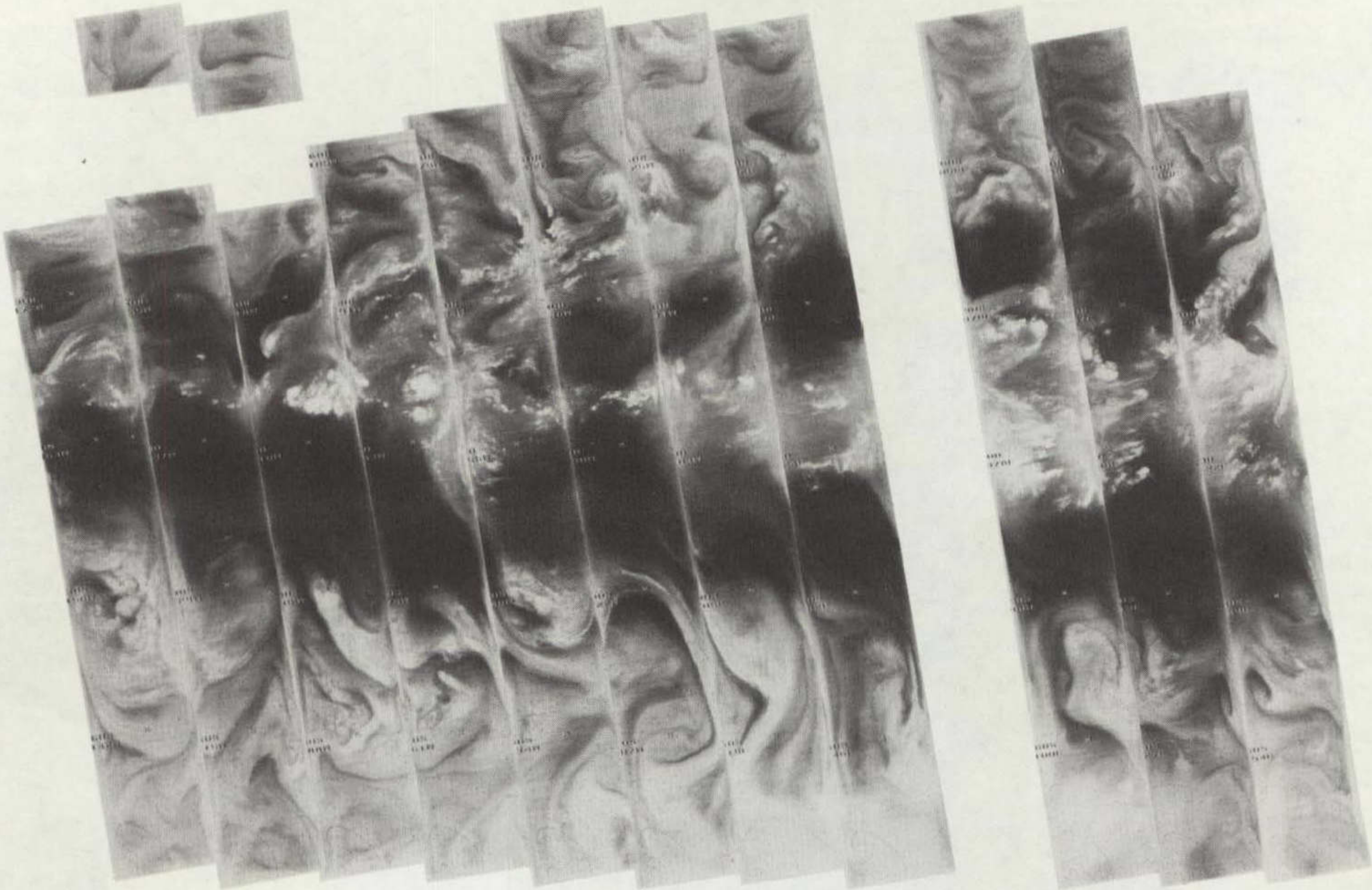
14 AUGUST 1975

6.7 μm

854 853 852 851 850 849 848 847 846 845 844 843 842 841

14 AUGUST 1975

11.5 μm



867 866 865 864 863 862 861 860 859 858 857 856 855

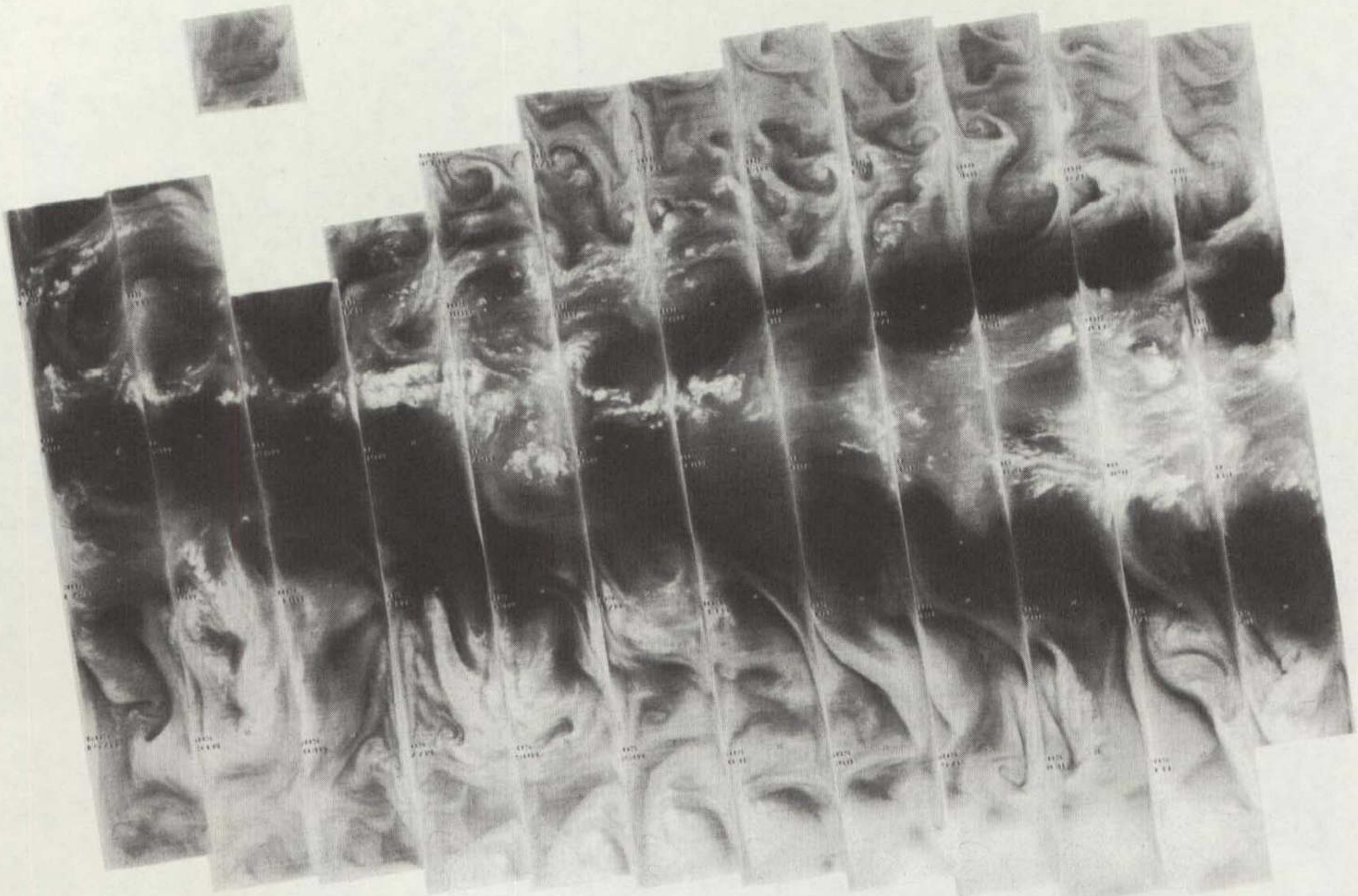
15 AUGUST 1975

6.7 μm

867 866 865 864 863 862 861 860 859 858 857 856 855

15 AUGUST 1975

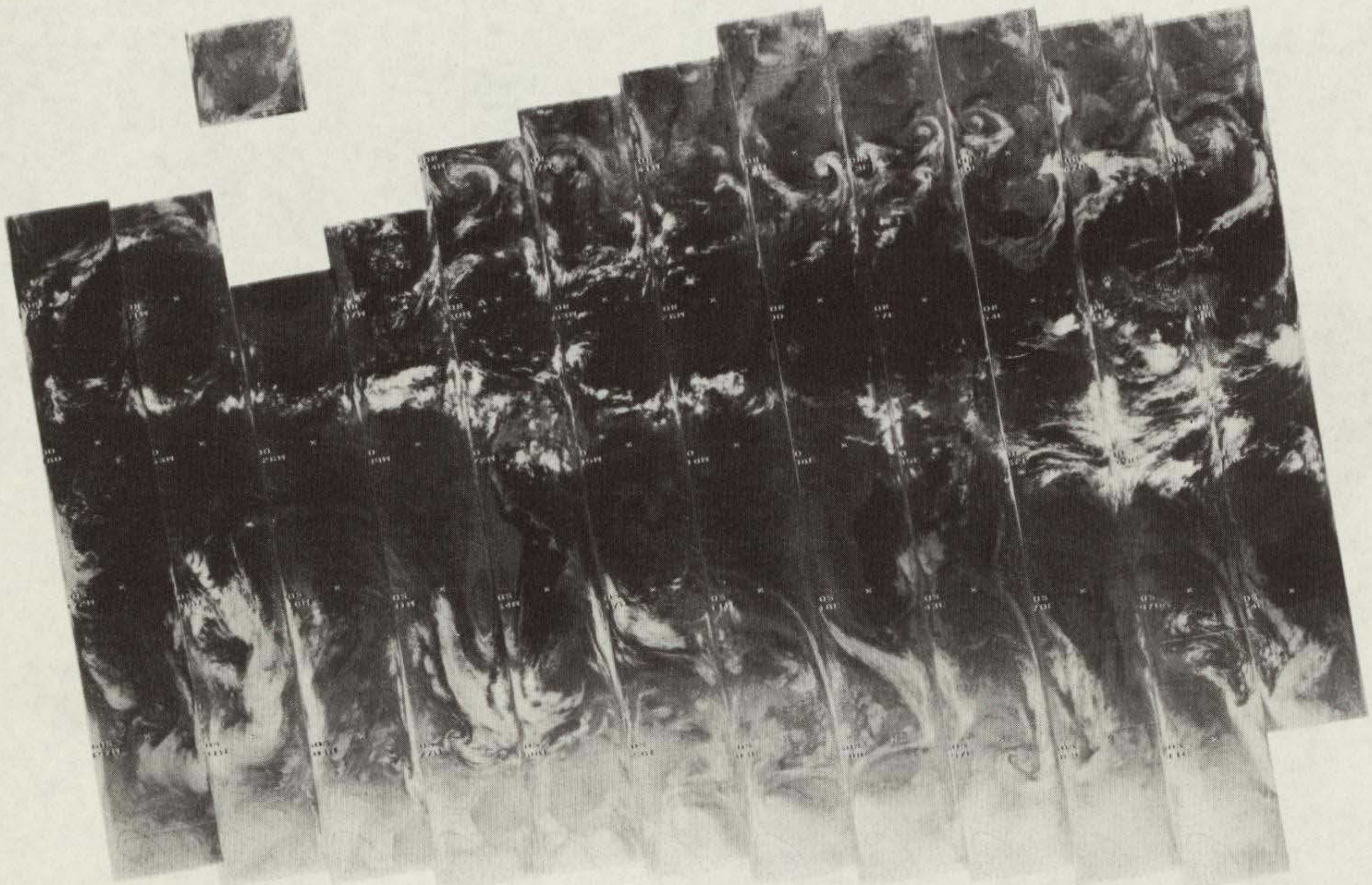
11.5 μm



881 880 879 878 877 876 875 874 873 872 871 870 869 868

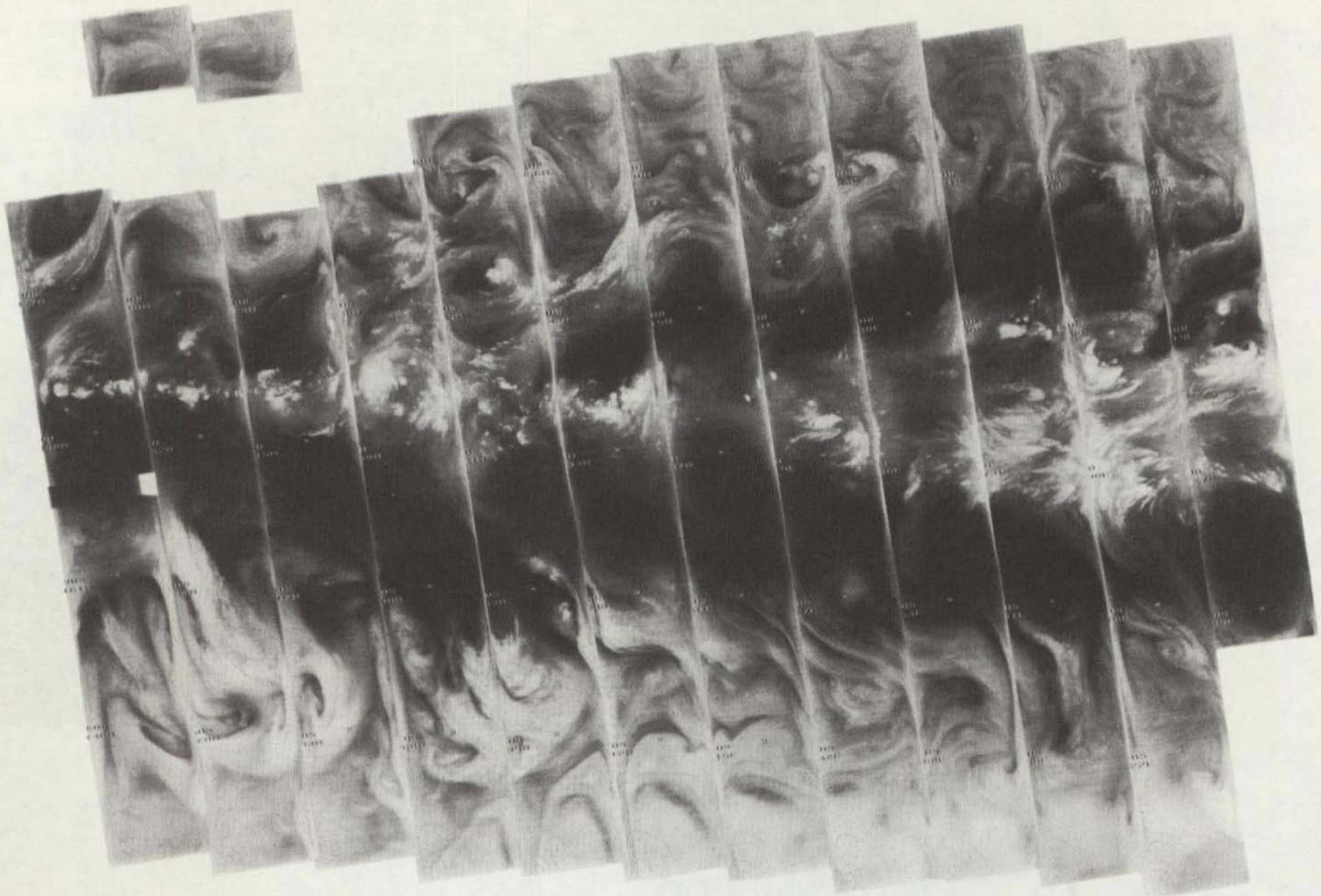
16 AUGUST 1975

6.7 μm



16 AUGUST 1975

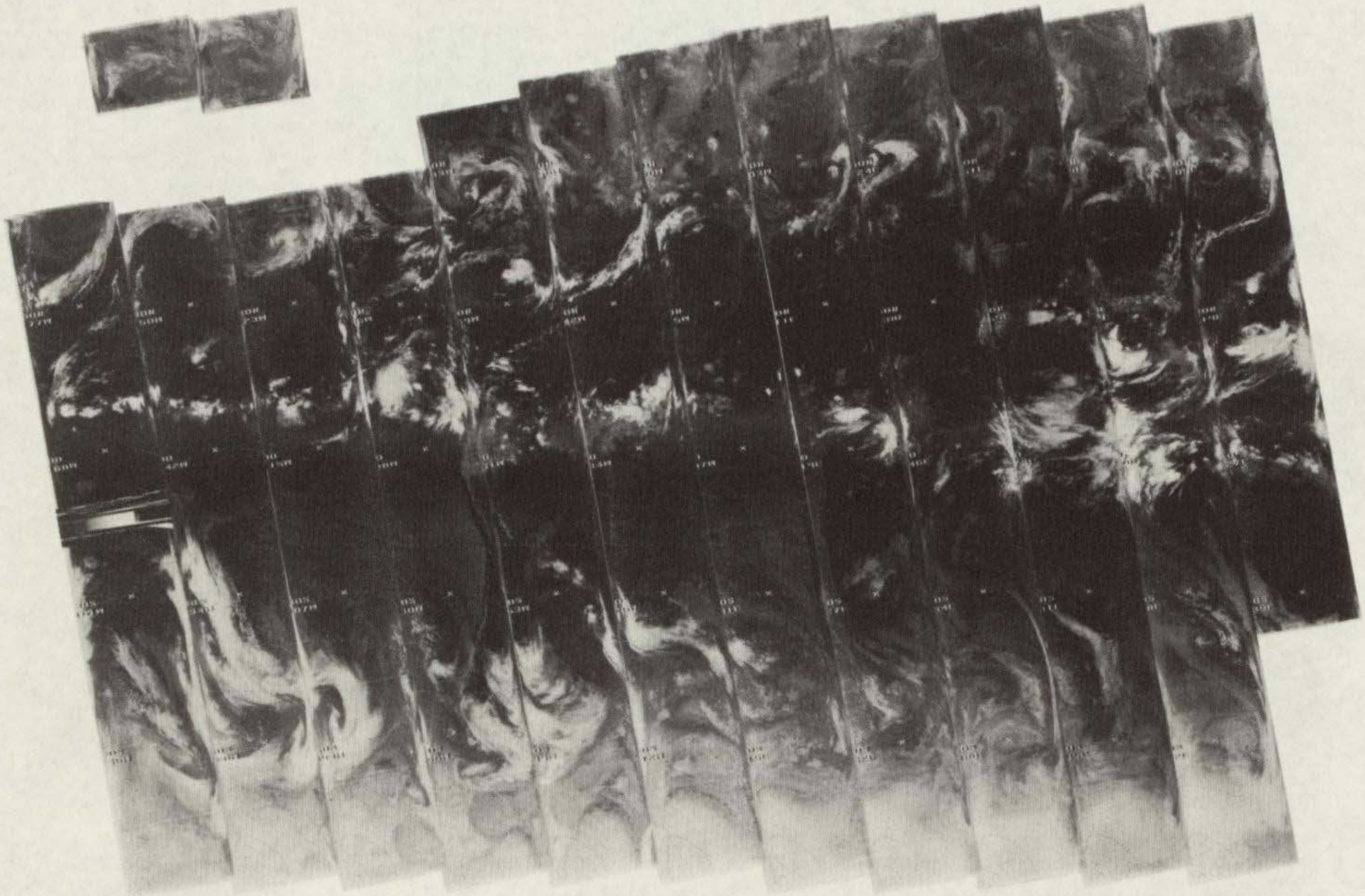
11.5 μm



894 893 892 891 890 889 888 887 886 885 884 883 882

17 AUGUST 1975

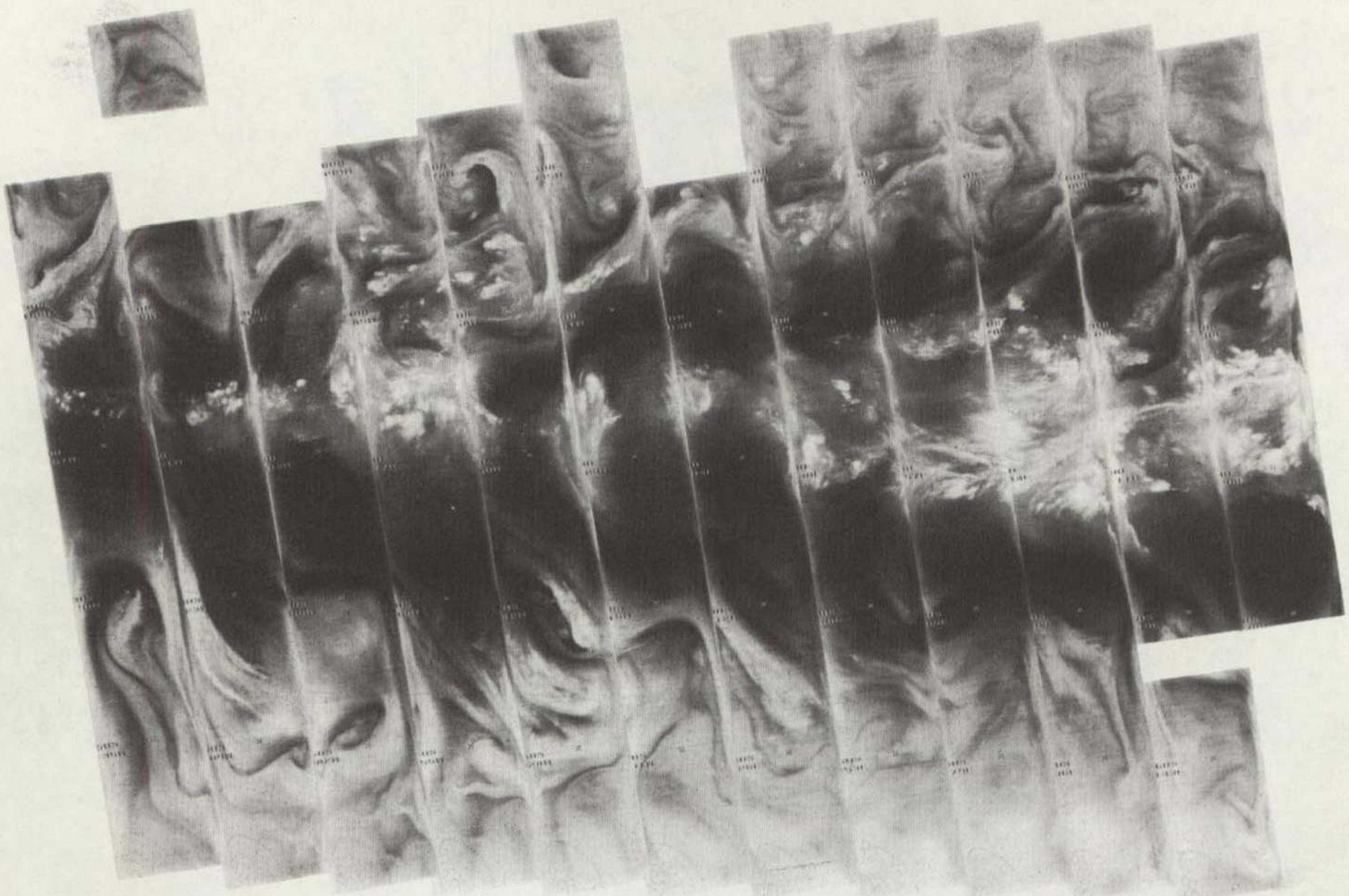
6.7 μm



894 893 892 891 890 889 888 887 886 885 884 883 882

17 AUGUST 1975

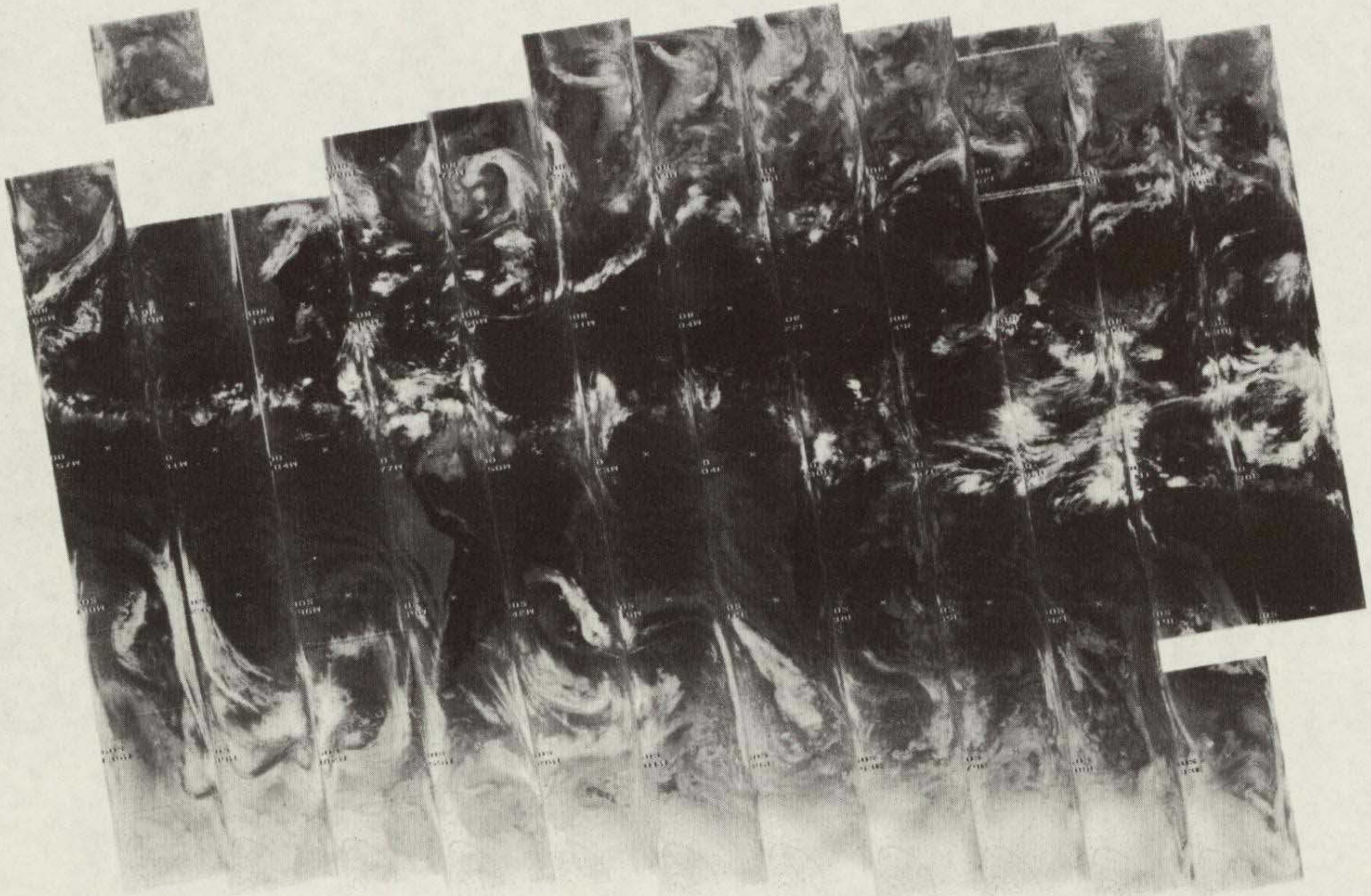
11.5 μm



907 906 905 904 903 902 901 900 899 898 897 896 895

18 AUGUST 1975

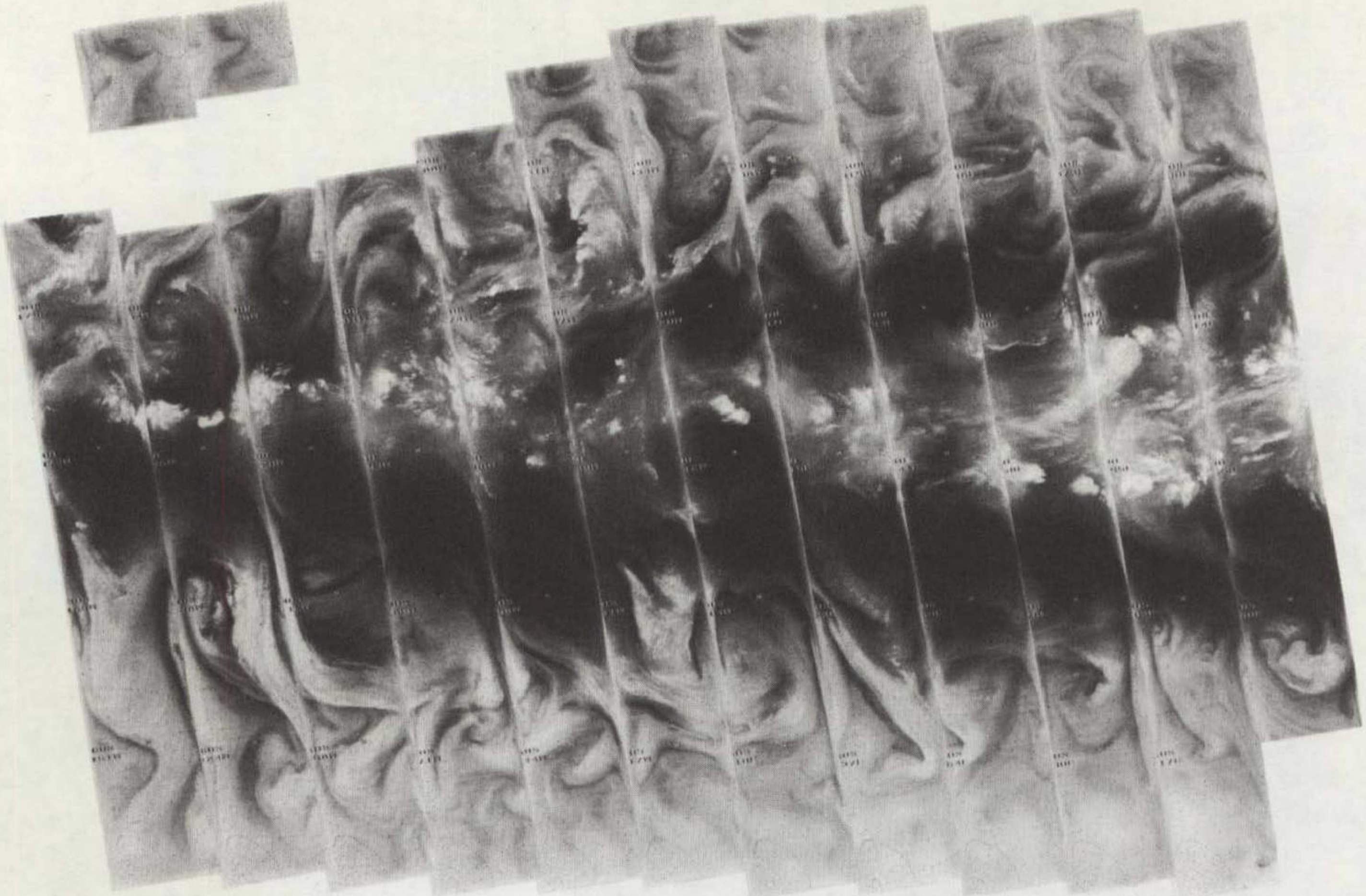
6.7 μm



907 906 905 904 903 902 901 900 899 898 897 896 895

18 AUGUST 1975

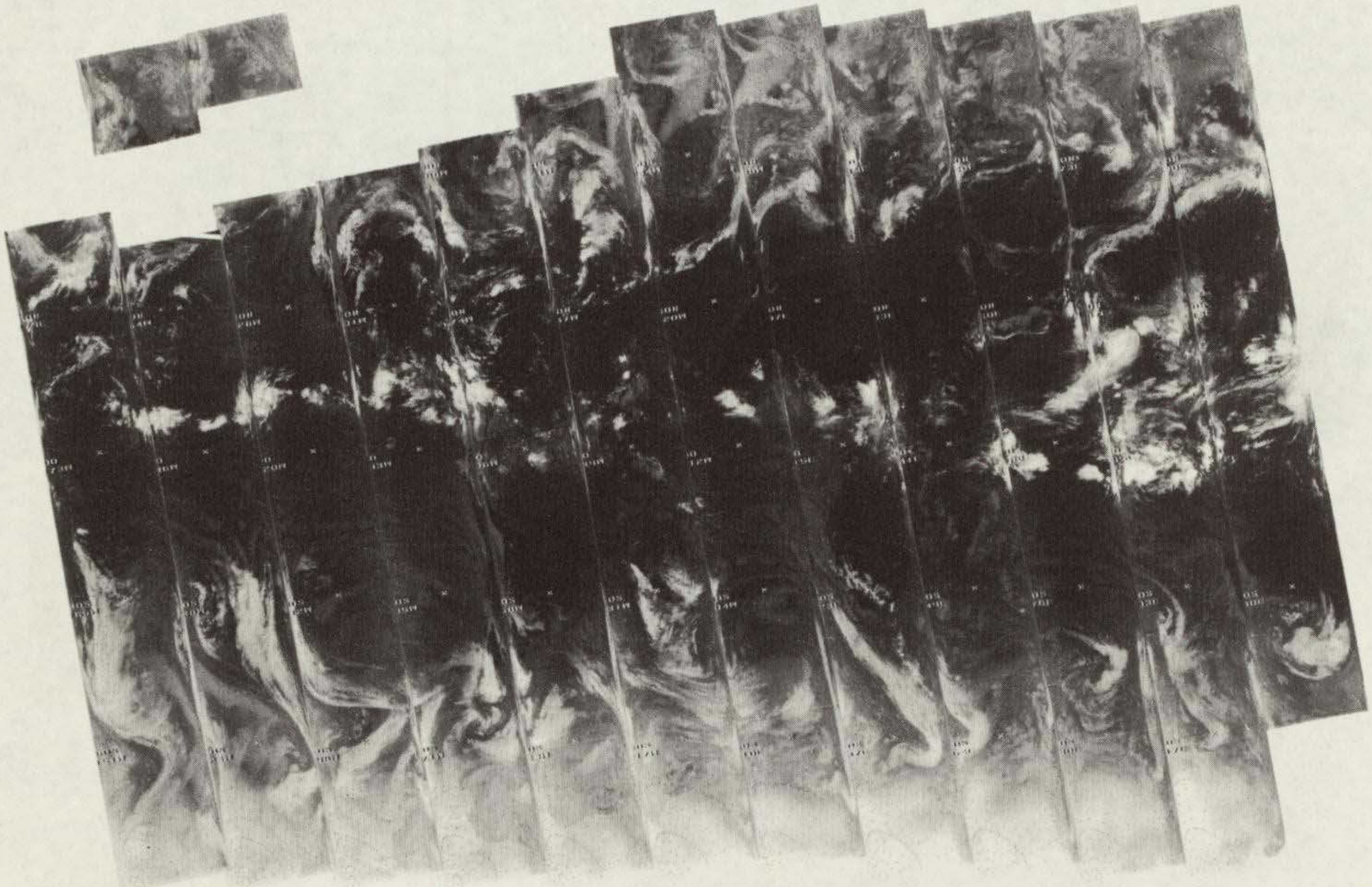
11.5 μm



921 920 919 918 917 916 915 914 913 912 911 910 909 908

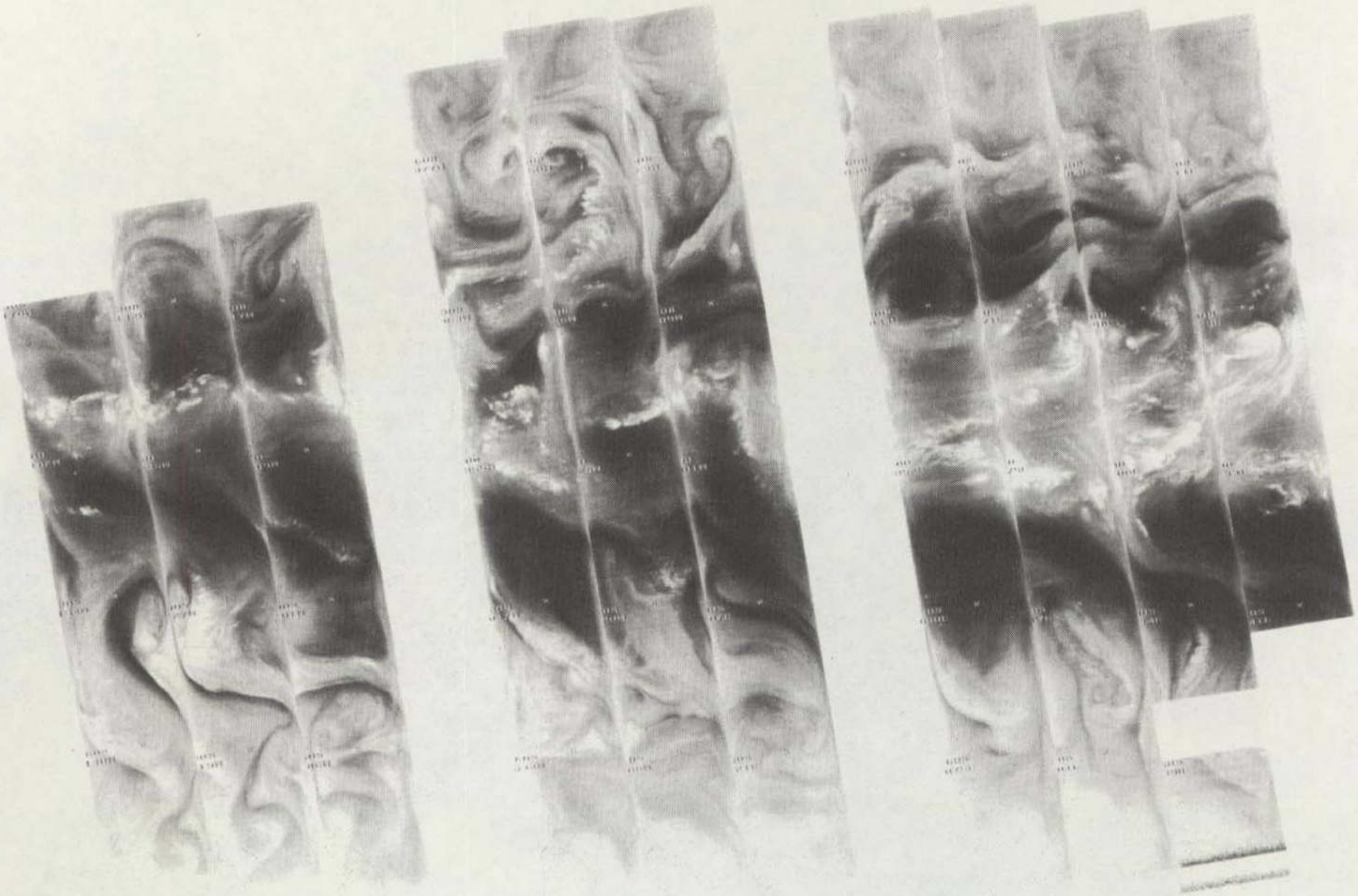
19 AUGUST 1975

6.7 μm



19 AUGUST 1975

11.5 μm



934 933 932 931 930 929 928 927 926 925 924 923 922

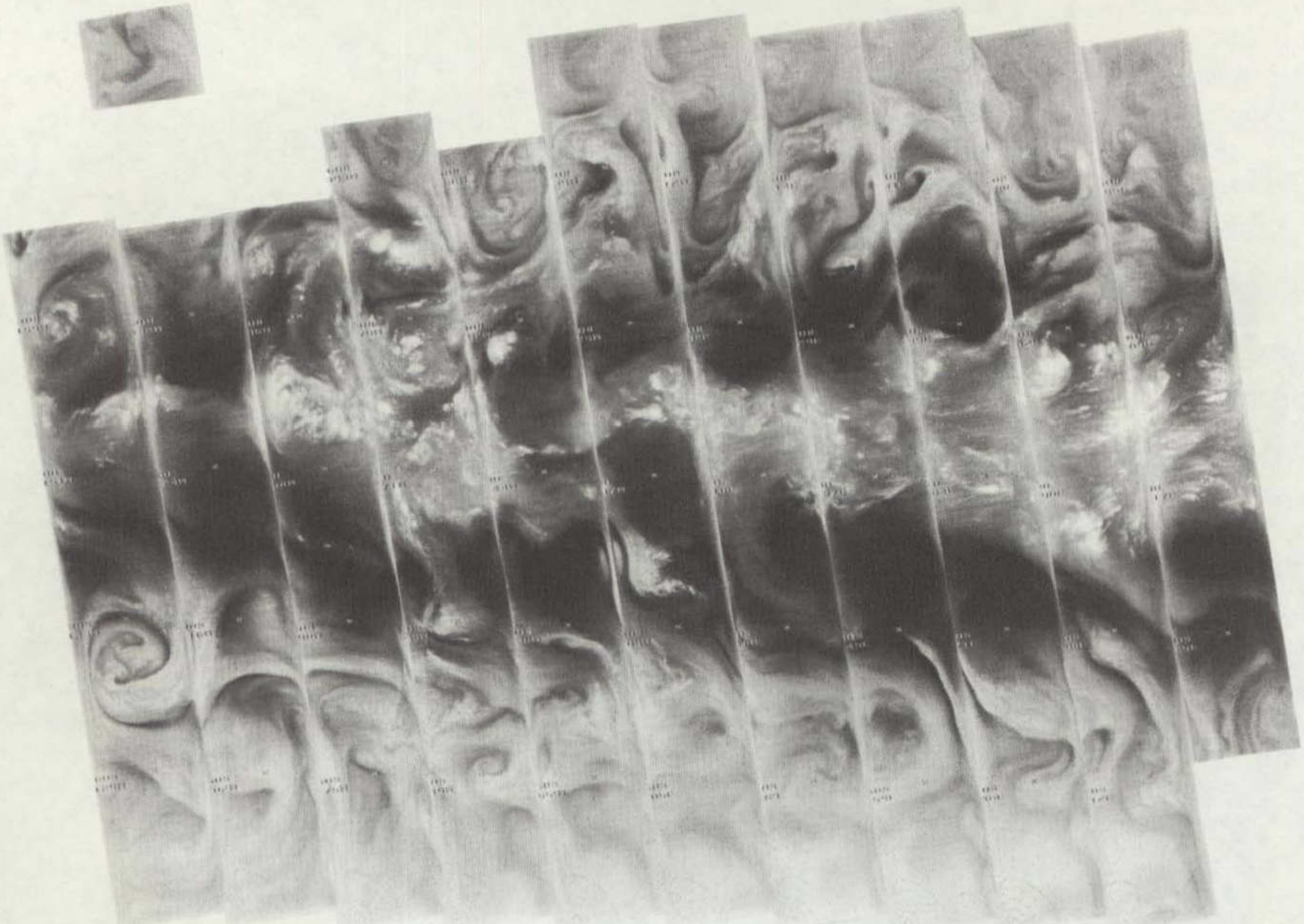
20 AUGUST 1975

6.7 μm

934 933 932 931 930 929 928 927 926 925 924 923 922

20 AUGUST 1975

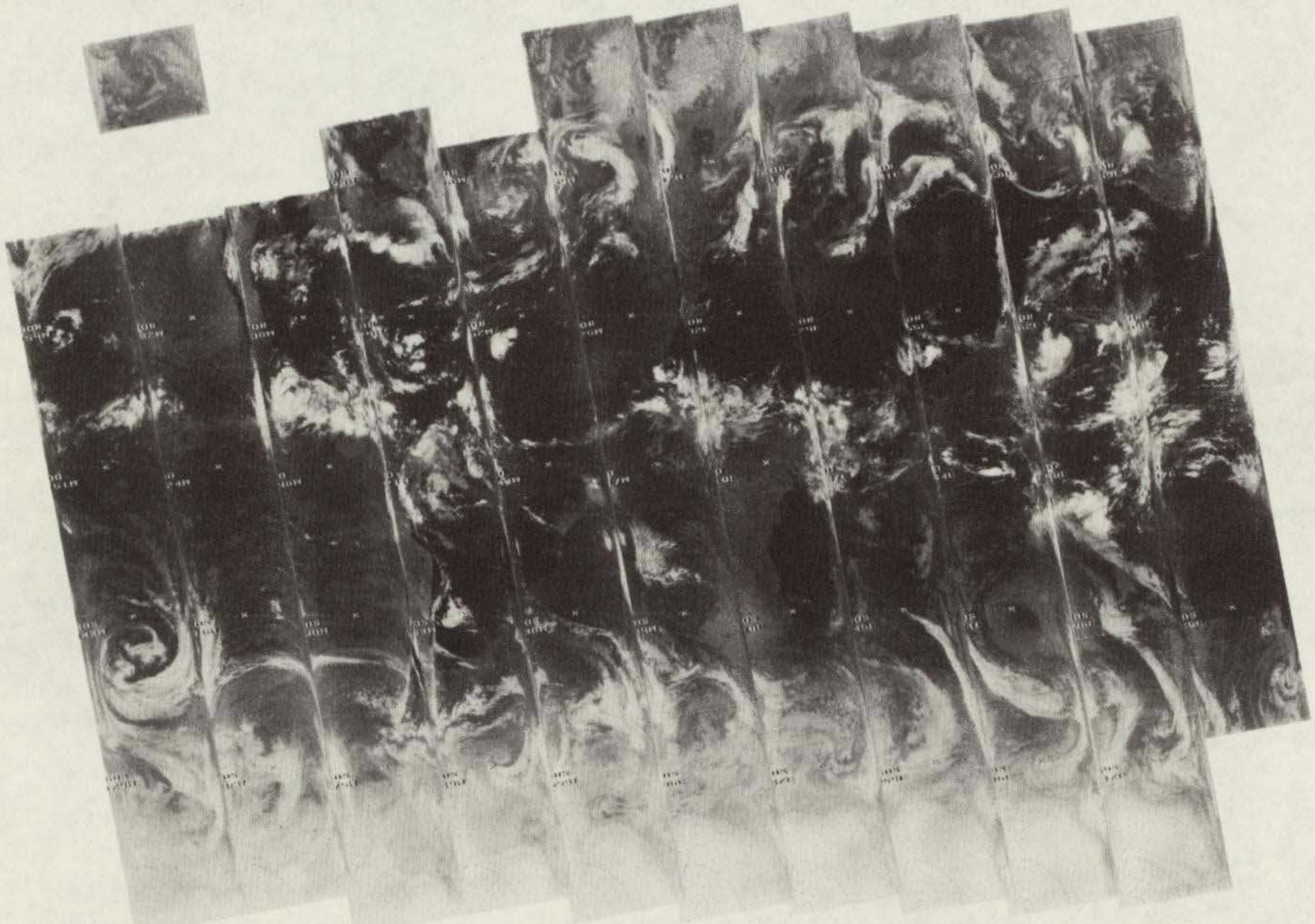
11.5 μm



948 947 946 945 944 943 942 941 940 939 938 937 936 935

21 AUGUST 1975

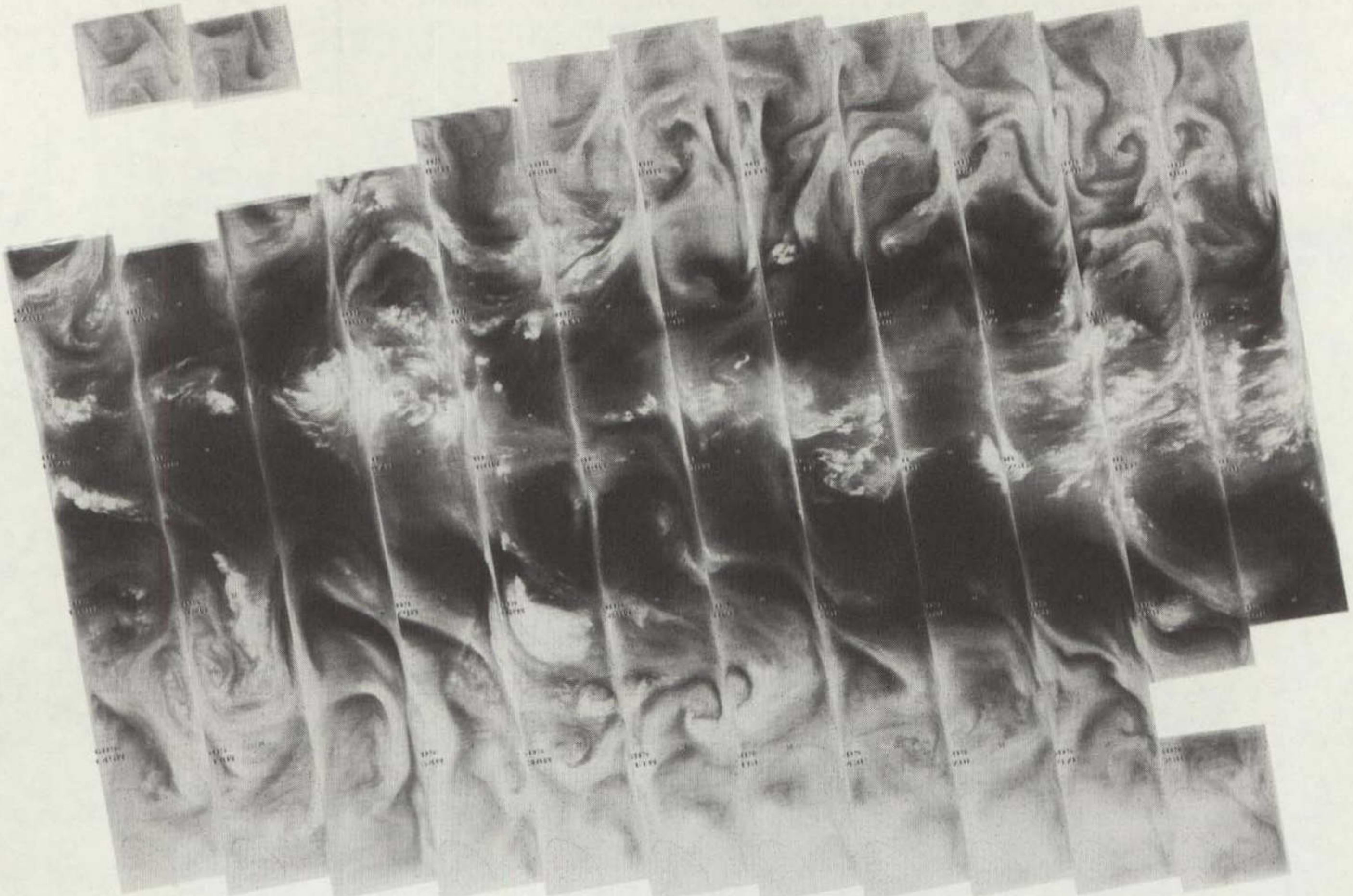
6.7 μm



948 947 946 945 944 943 942 941 940 939 938 937 936 935

21 AUGUST 1975

11.5 μm



961 960 959 958 957 956 955 954 953 952 951 950 949

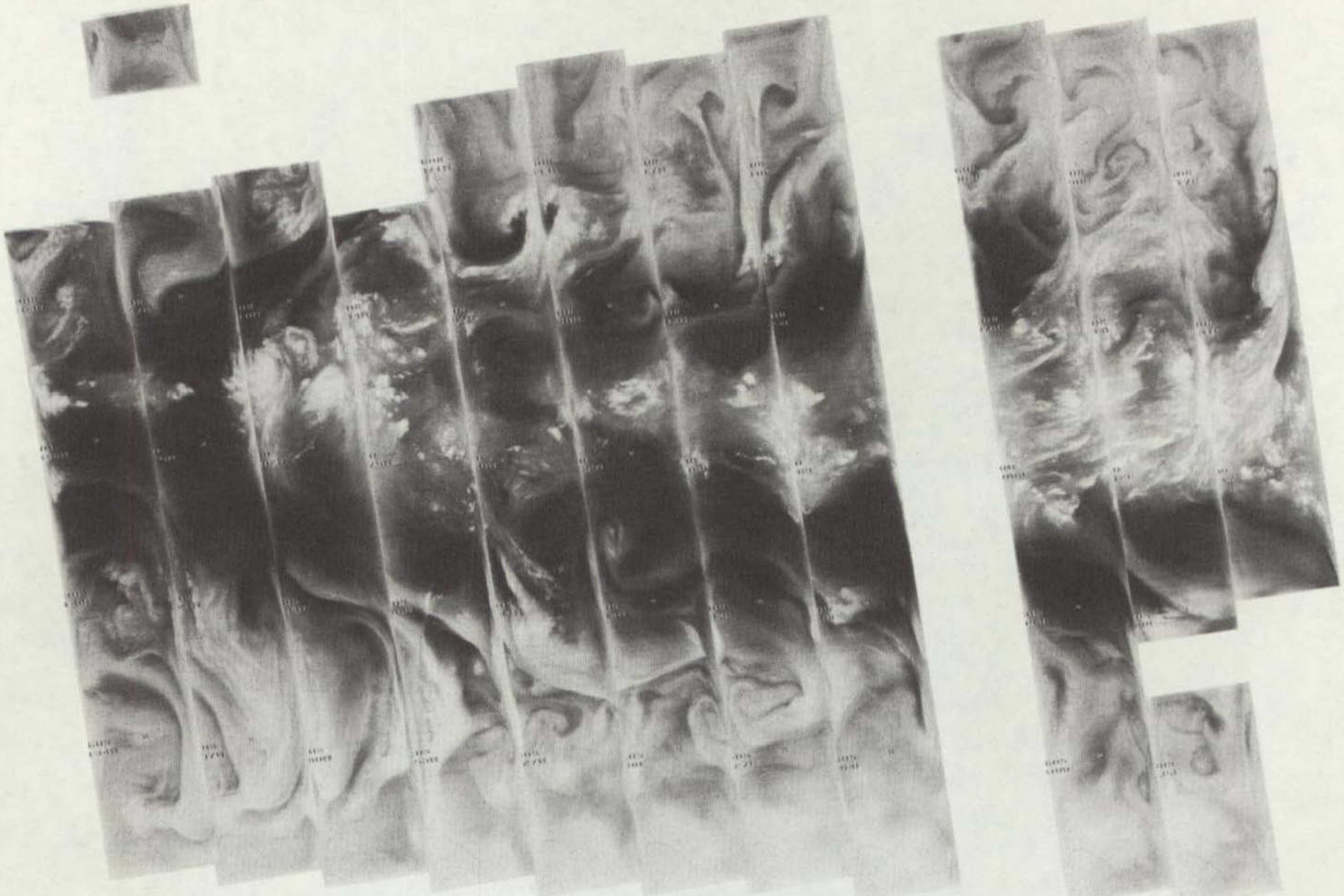
22 AUGUST 1975

6.7 μm

961 960 959 958 957 956 955 954 953 952 951 950 949

22 AUGUST 1975

11.5 μm



975 974 973 972 971 970 969 968 967 966 965 964 963 962

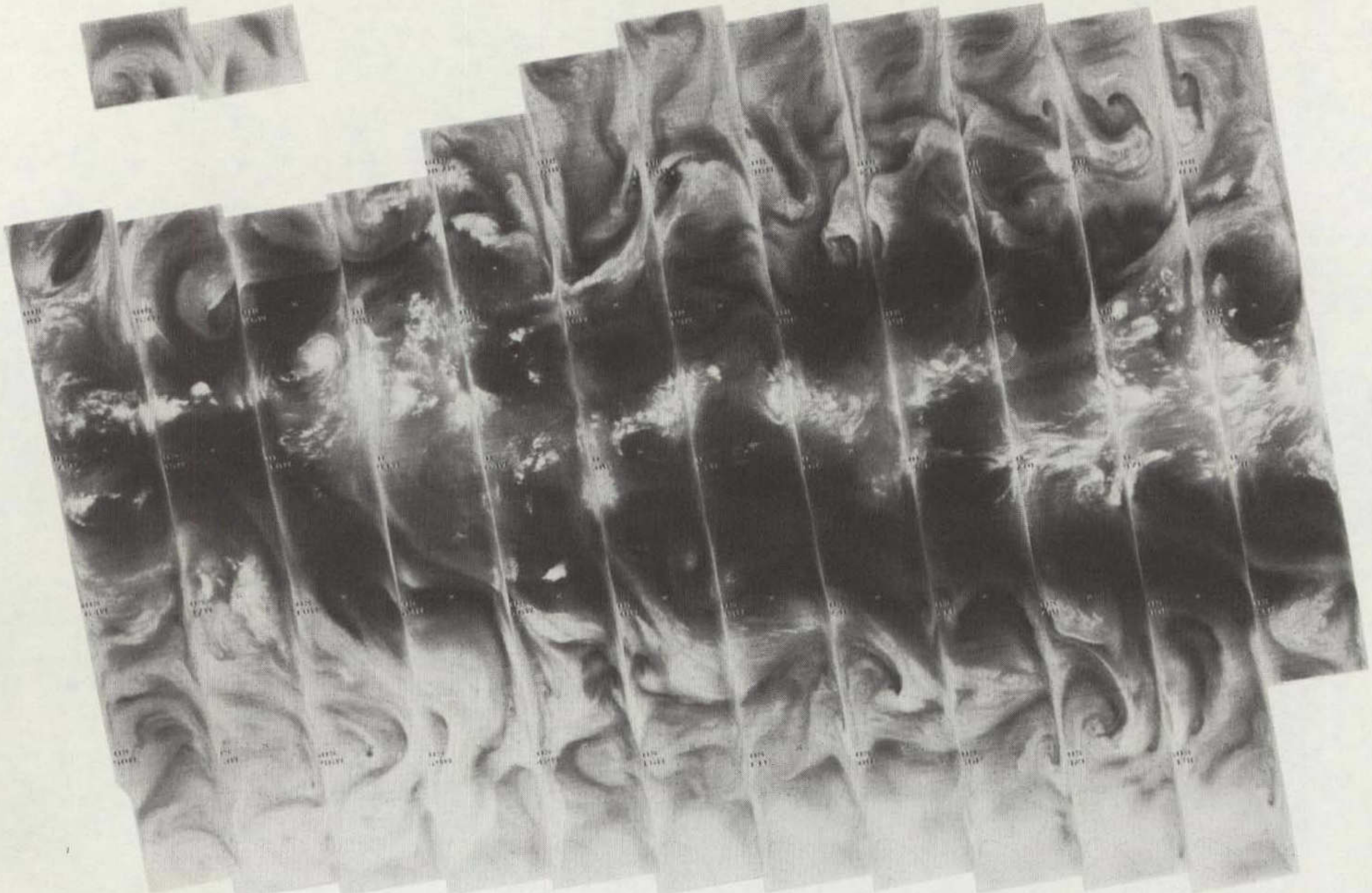
23 AUGUST 1975

6.7 μm

975 974 973 972 971 970 969 968 967 966 965 964 963 962

23 AUGUST 1975

11.5 μm



988 987 986 985 984 983 982 981 980 979 978 977 976

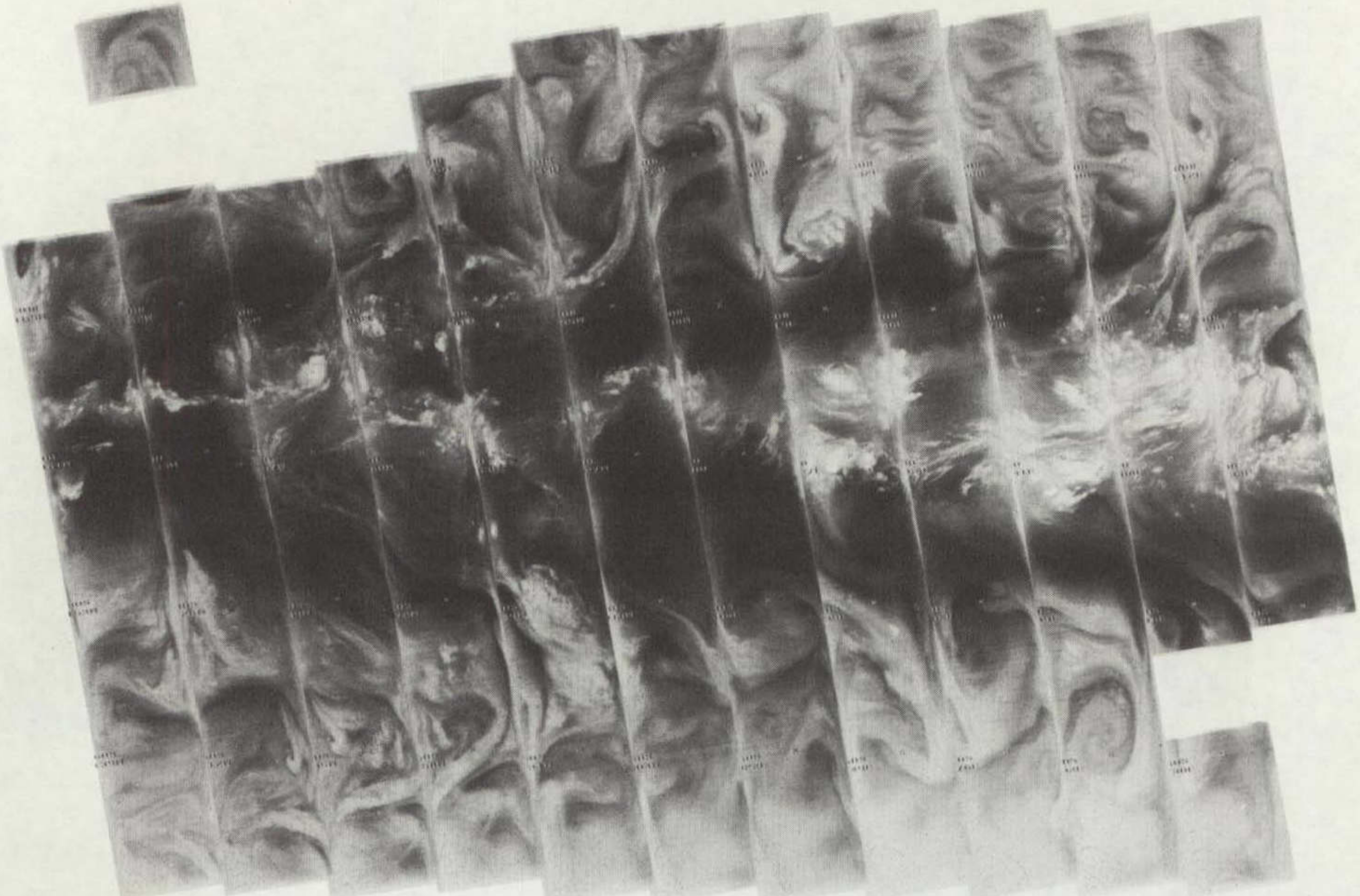
24 AUGUST 1975

6.7 μm

988 987 986 985 984 983 982 981 980 979 978 977 976

24 AUGUST 1975

11.5 μm



1001 1000 999 998 997 996 995 994 993 992 991 990 989

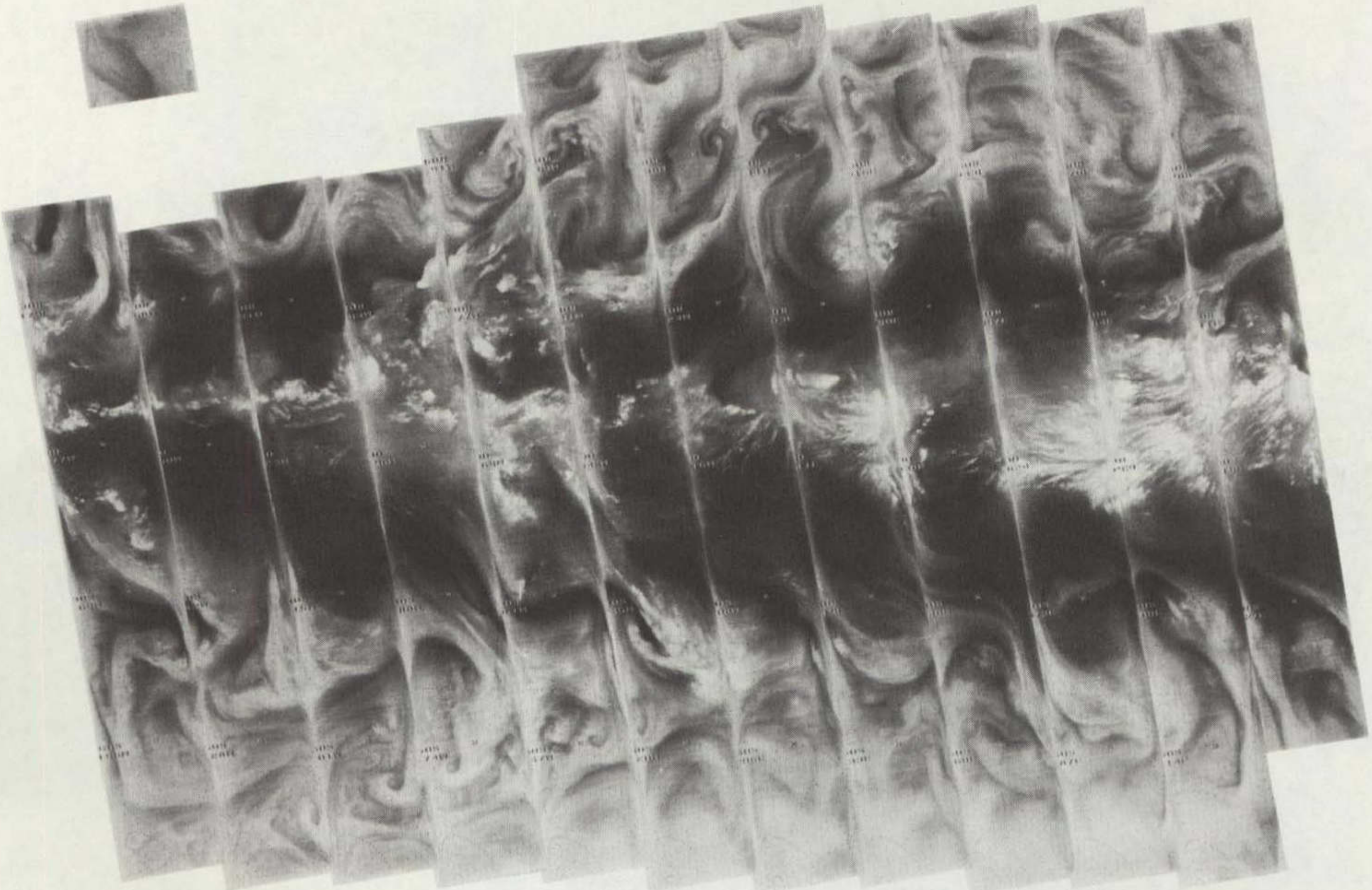
25 AUGUST 1975

6.7 μm

1001 1000 999 998 997 996 995 994 993 992 991 990 989

25 AUGUST 1975

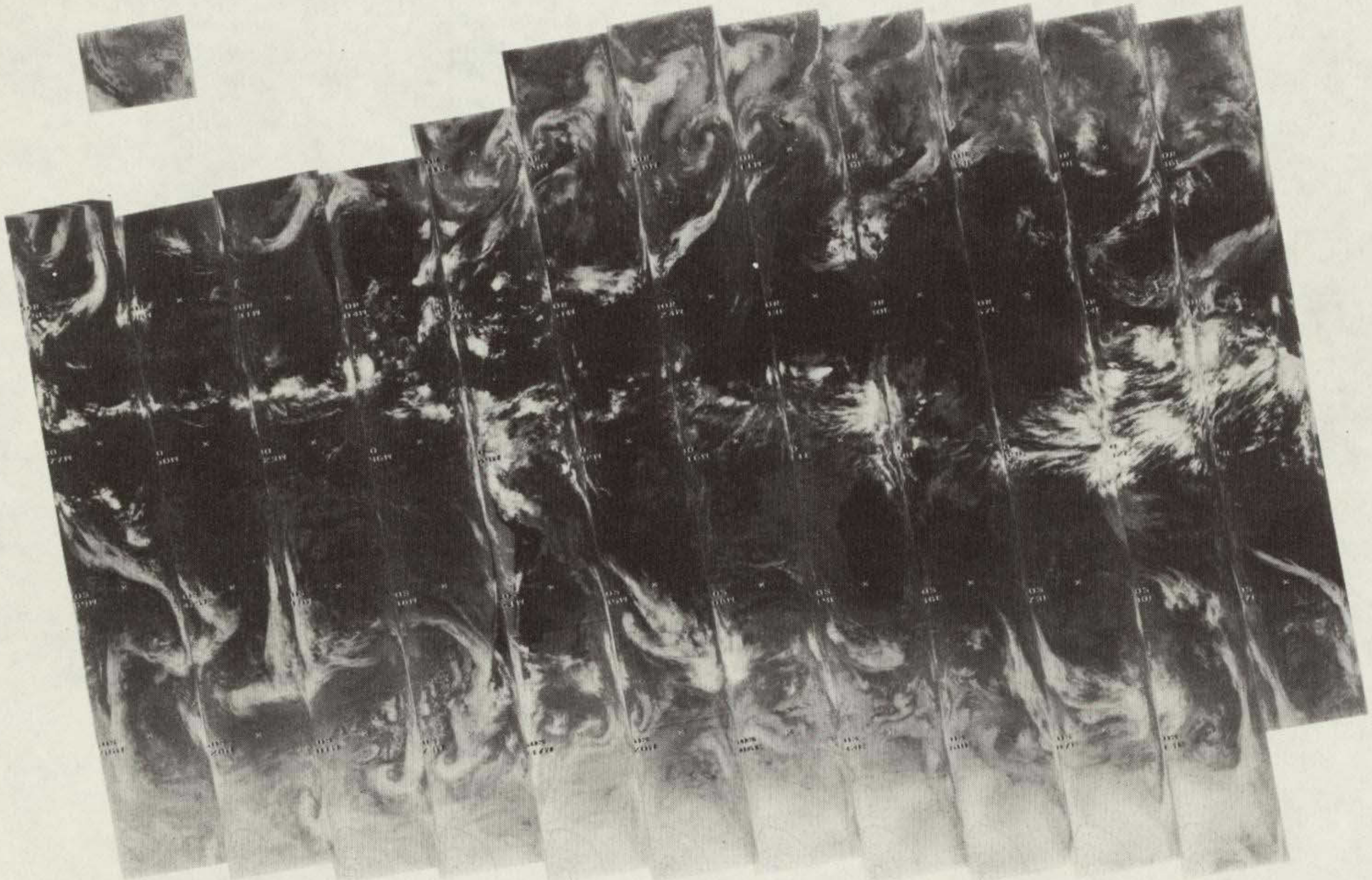
11.5 μm



1015 1014 1013 1012 1011 1010 1009 1008 1007 1006 1005 1004 1003 1002

26 AUGUST 1975

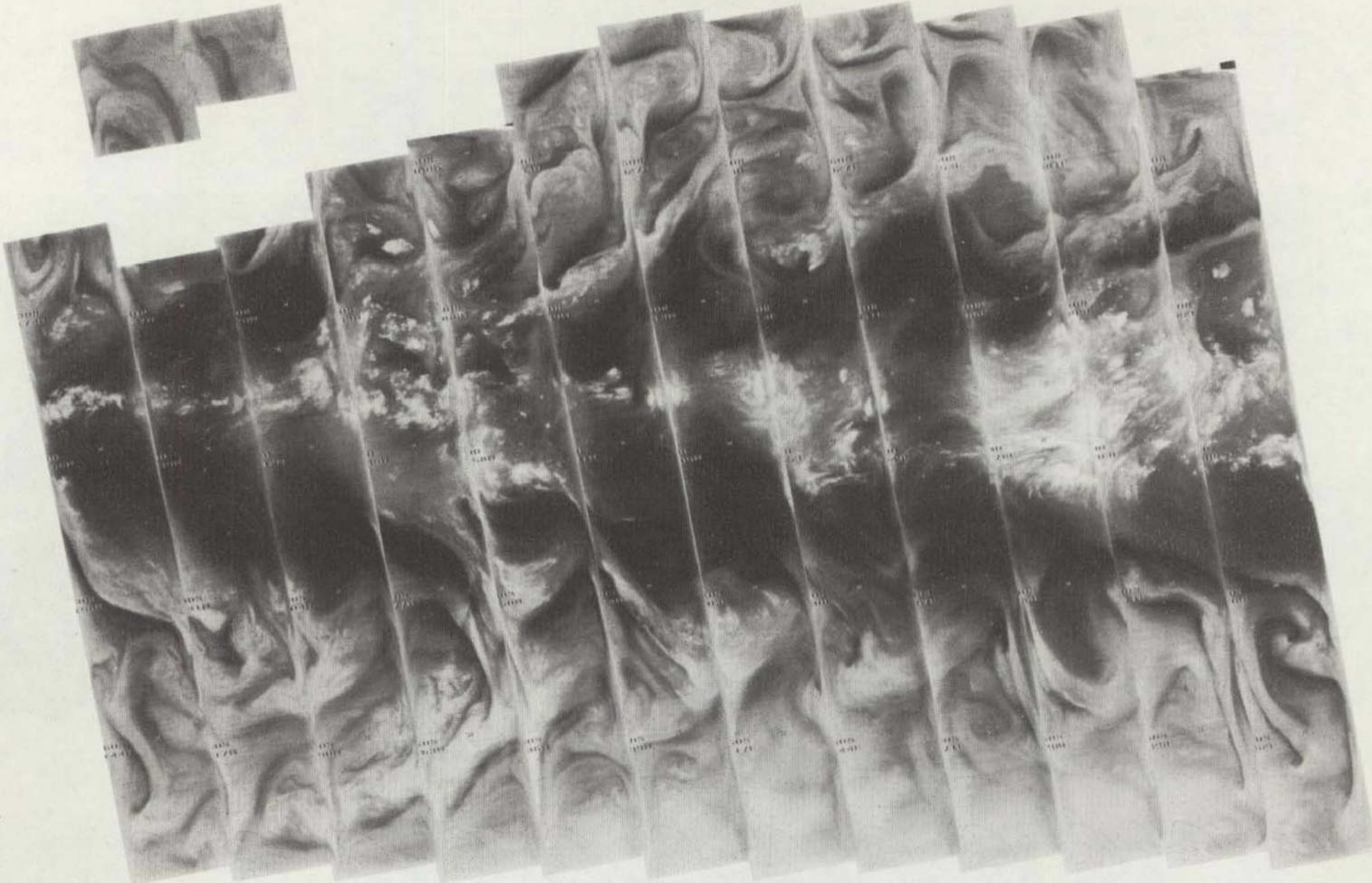
6.7 μm



1015 1014 1013 1012 1011 1010 1009 1008 1007 1006 1005 1004 1003 1002

26 AUGUST 1975

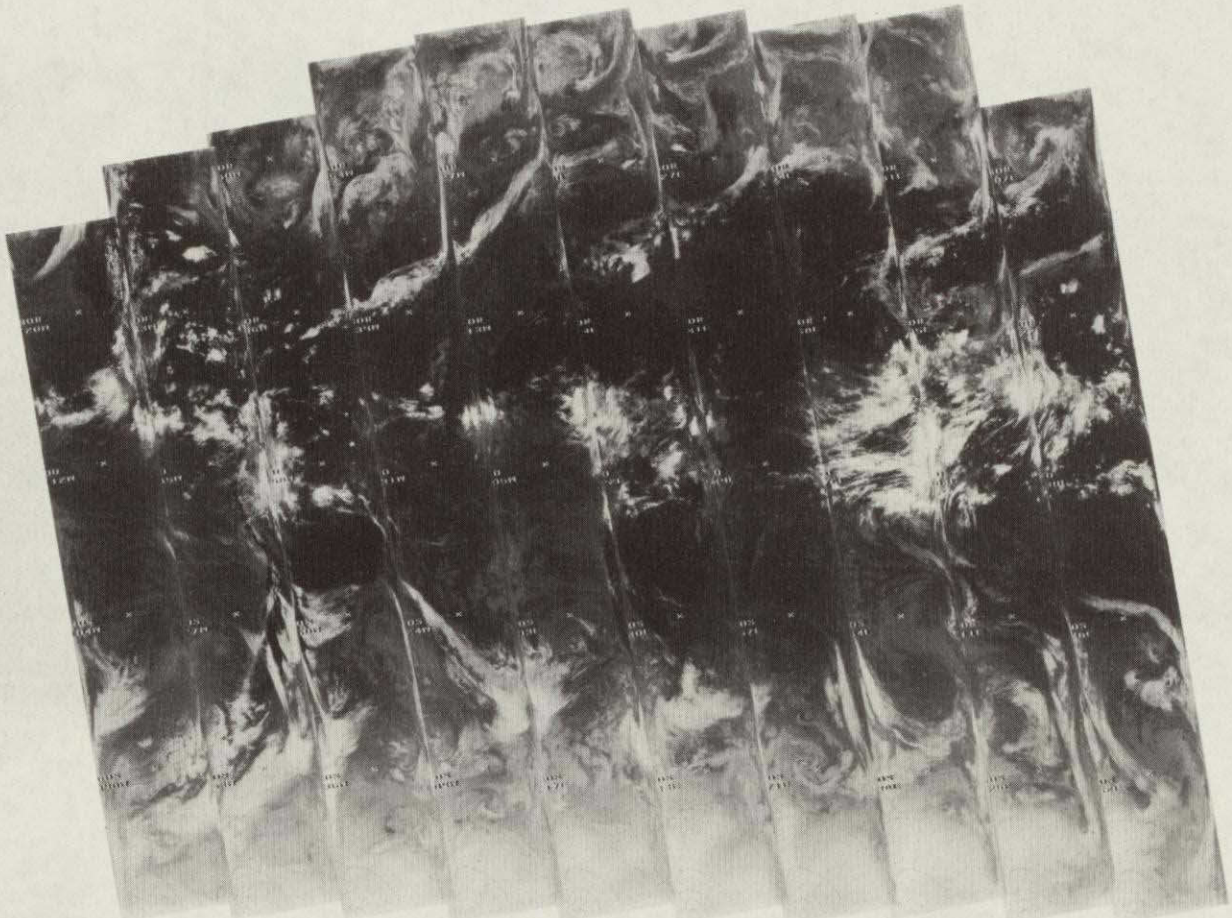
11.5 μm



1028 1027 1026 1025 1024 1023 1022 1021 1020 1019 1018 1017 1016

27 AUGUST 1975

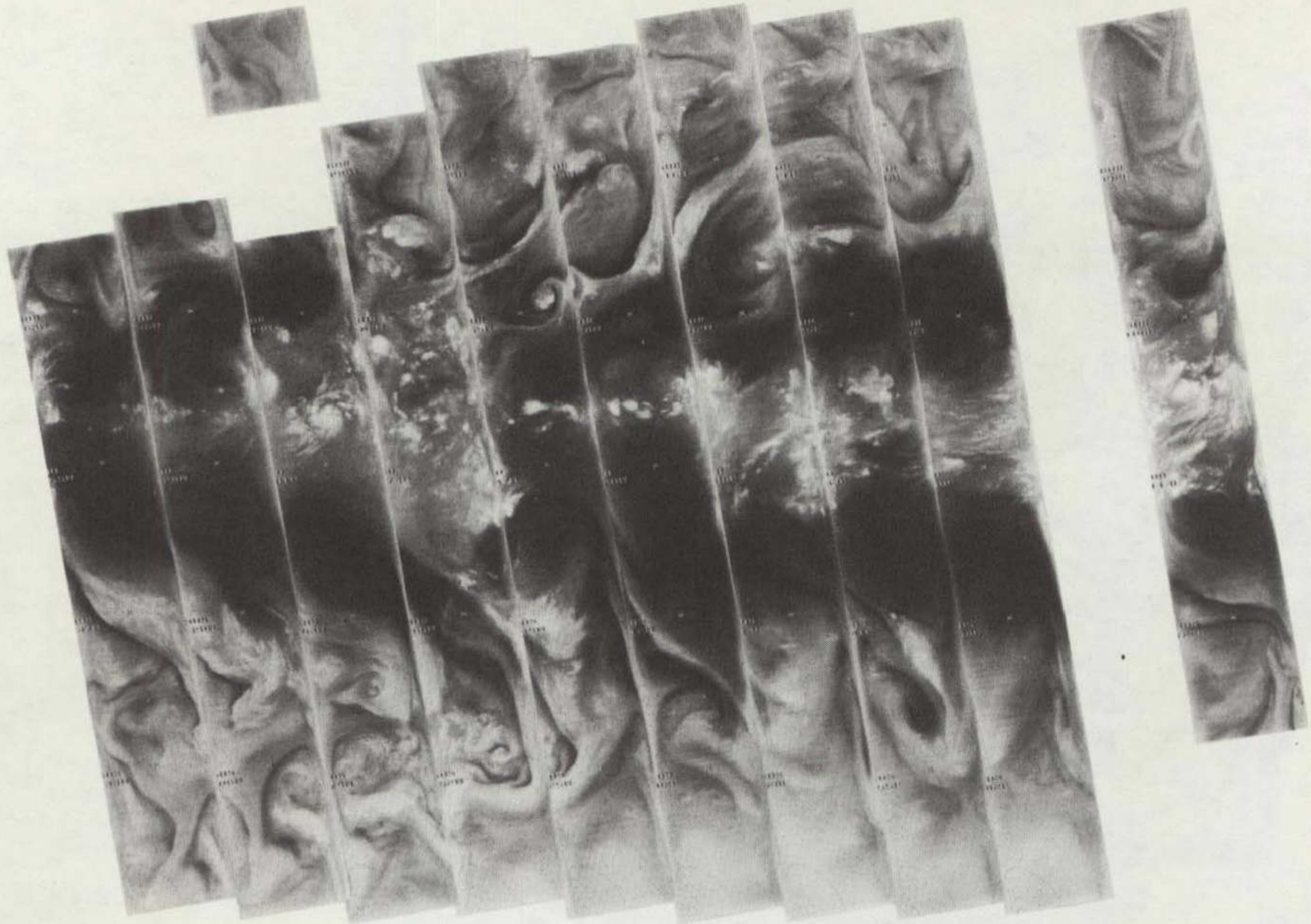
6.7 μm



1028 1027 1026 1025 1024 1023 1022 1021 1020 1019 1018 1017 1016

27 AUGUST 1975

11.5 μm



1042 1041 1040 1039 1038 1037 1036 1035 1034 1033 1032 1031 1030 1029

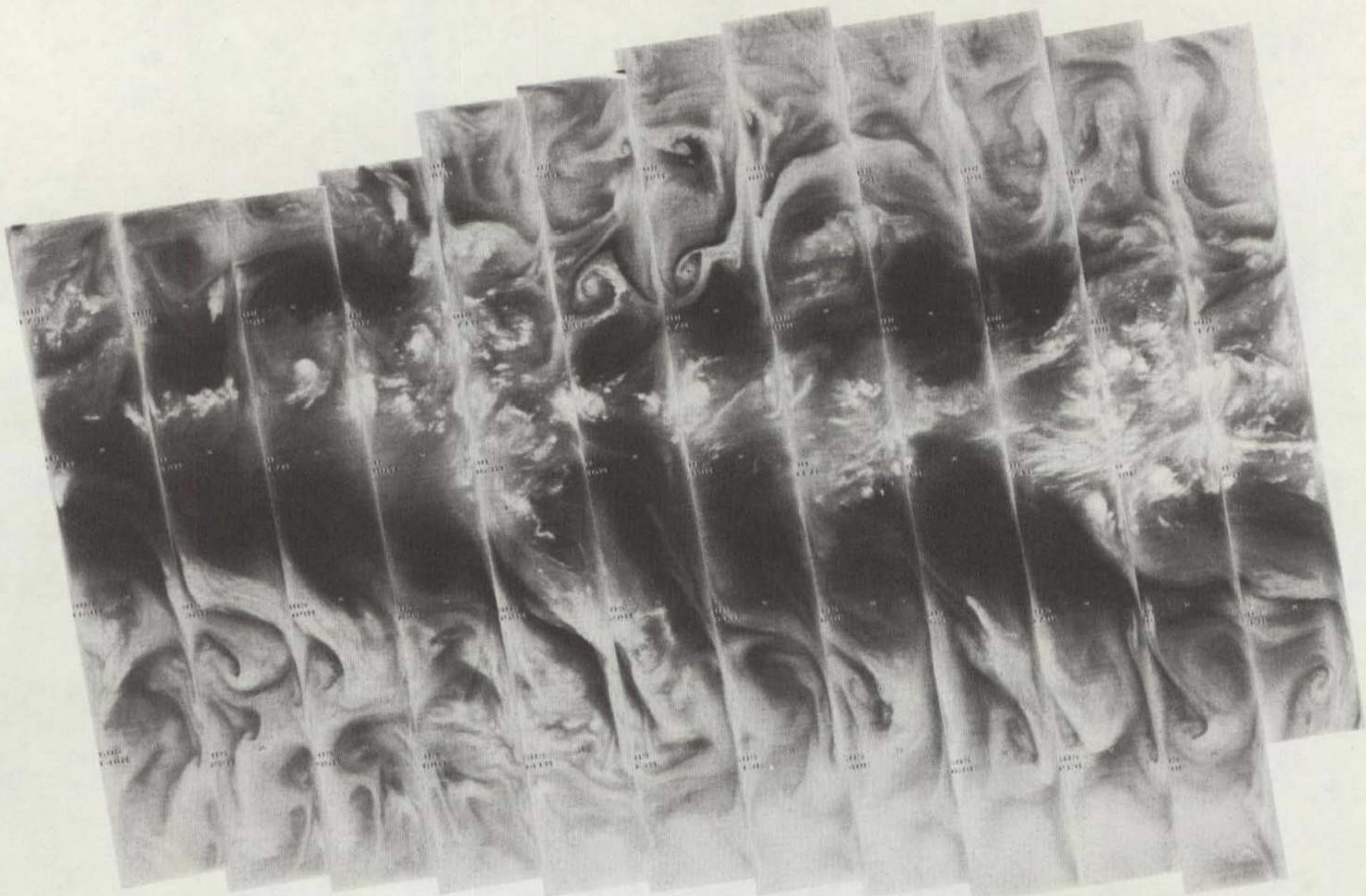
28 AUGUST 1975

6.7 μm

1042 1041 1040 1039 1038 1037 1036 1035 1034 1033 1032 1031 1030 1029

28 AUGUST 1975

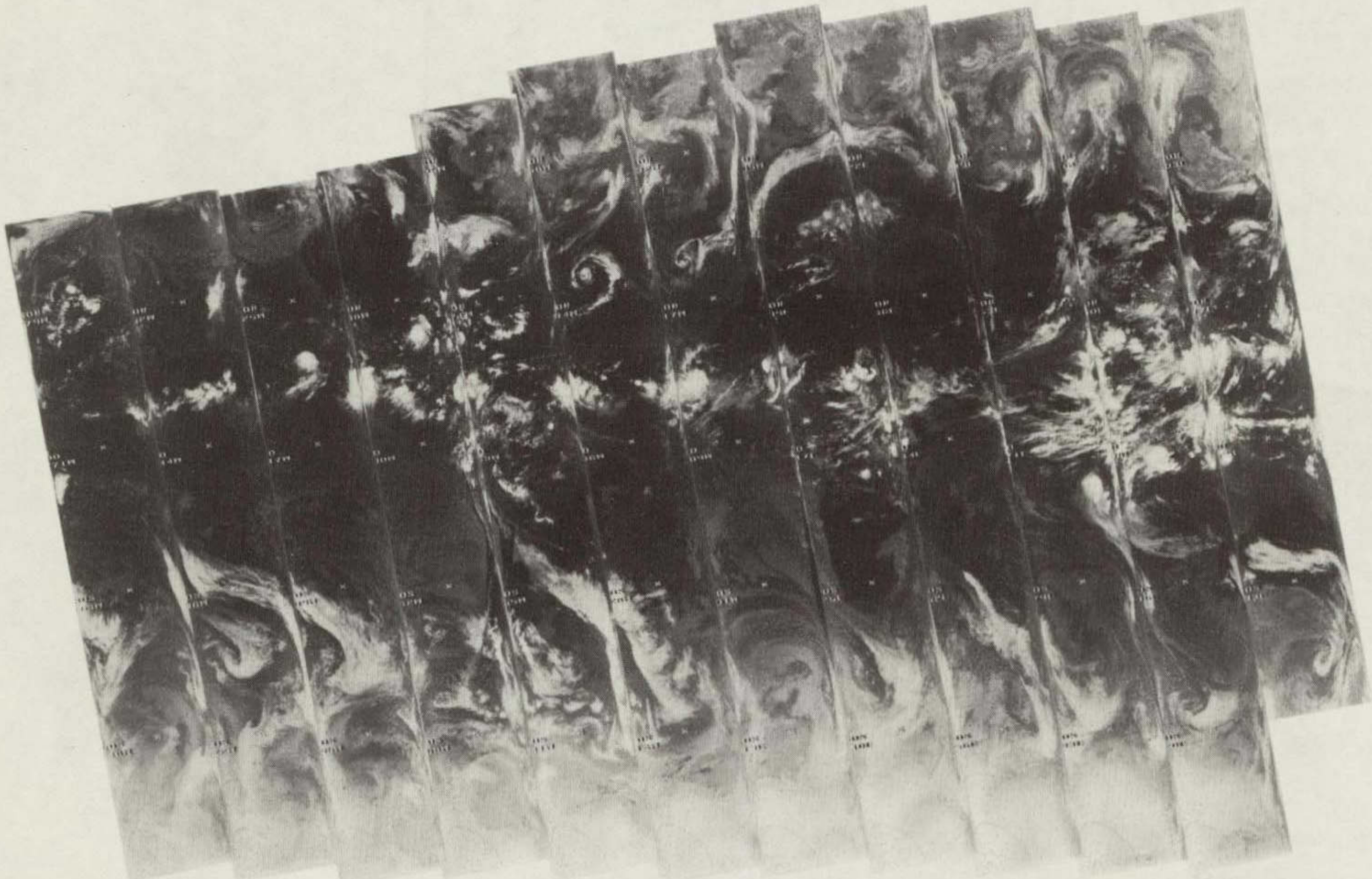
11.5 μm



1055 1054 1053 1052 1051 1050 1049 1048 1047 1046 1045 1044 1043

29 AUGUST 1975

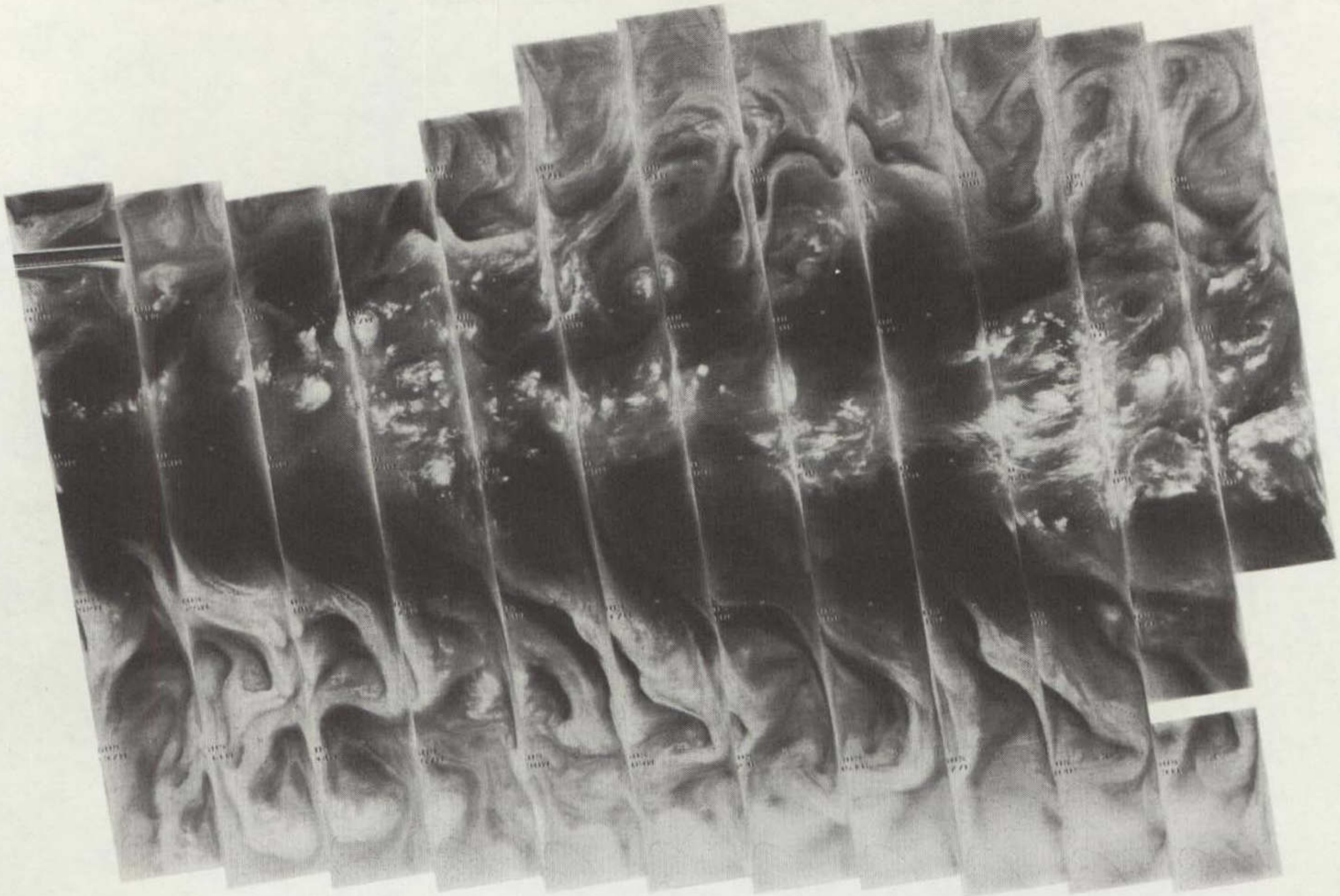
6.7 μm



1055 1054 1053 1052 1051 1050 1049 1048 1047 1046 1045 1044 1043

29 AUGUST 1975

11.5 μm

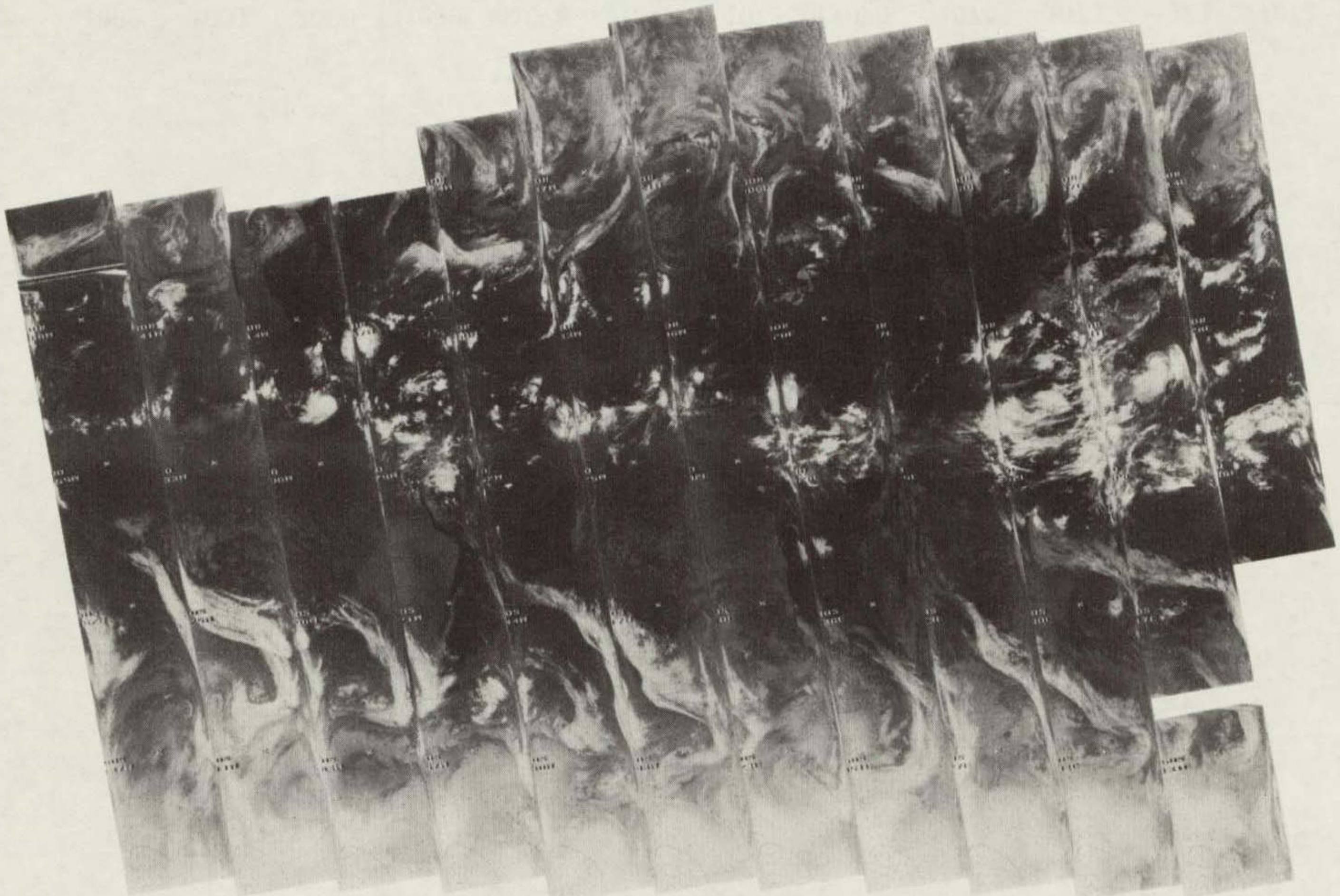


1068 1067 1066 1065 1064 1063 1062 1061 1060 1059 1058 1057 1056

30 AUGUST 1975

6.7 μm

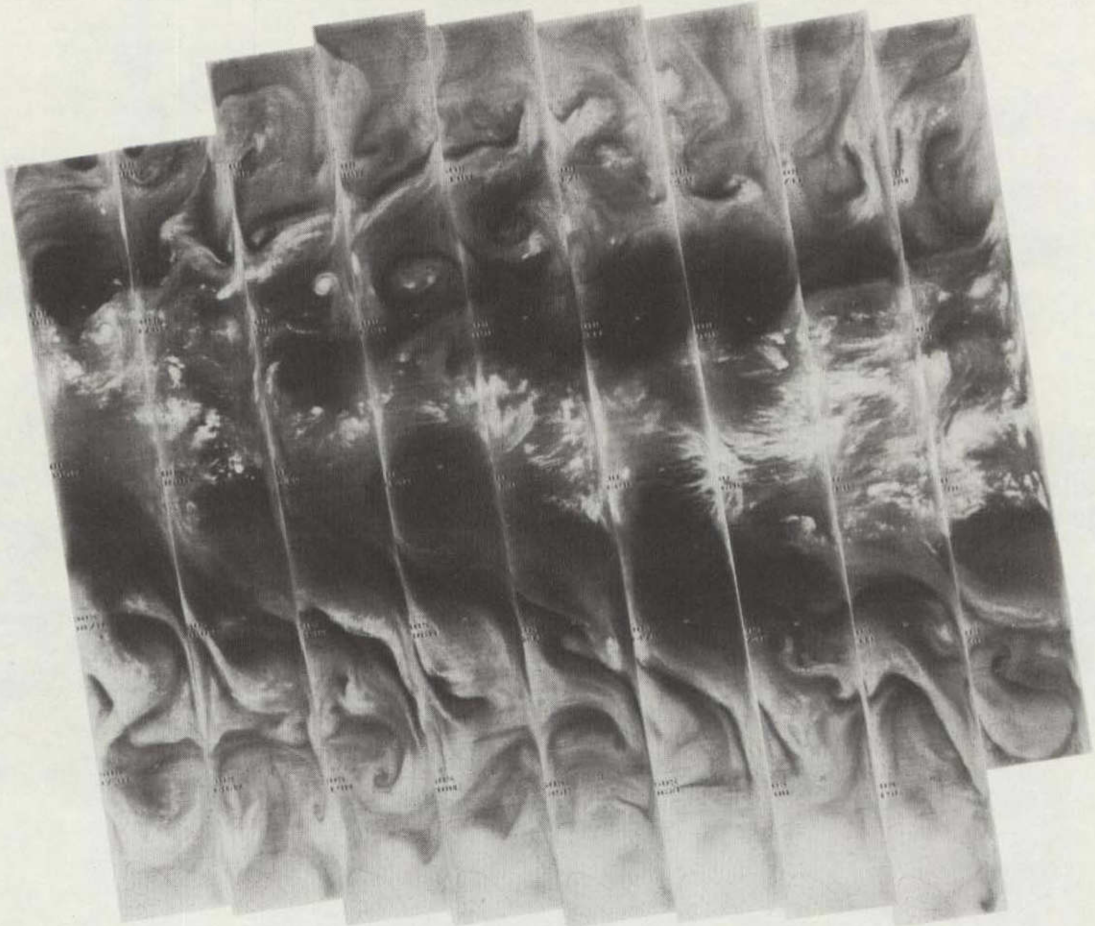
C-4



1068 1067 1066 1065 1064 1063 1062 1061 1060 1059 1058 1057 1056

30 AUGUST 1975

11.5 μm



1082 1081 1080 1079 1078 1077 1076 1075 1074 1073 1072 1071 1070 1069

31 AUGUST 1975

6.7 μm

1082 1081 1080 1079 1078 1077 1076 1075 1074 1073 1072 1071 0170 1069

31 AUGUST 1975

11.5 μm

SECTION 5

CORRECTIONS TO THE NIMBUS 6 USER'S GUIDE

This section presents all corrections or additions to The Nimbus 6 User's Guide, which now are known to be necessary. If additional corrections are required, they will appear in a subsequent catalog. All corrections will be carried forward cumulatively into each new catalog.

5.1 THIR Corrections to the User's Guide

The THIR mirror on Nimbus 6 rotates counter clockwise. Therefore, replace lines one through four on page 14 with the following:

> ". . . rotation is such that, when combined with the velocity vector of the satellite, a left-hand spiral results. Therefore, the mirror scans across the earth from west to east in the daytime when traveling northward, and from east to west at night when traveling southward."

The information in Figure 2-4 on page 17 is correct. However, the direction of scan is counter clockwise, and not clockwise as shown.

5.2 HIRS Corrections to the User's Guide

On page 40, Table 3-2, under "Detector Summary" change LnSe to LnSb.

The CHANNEL (and) RANGE information in the swaths displays for HIRS has been changed since launch, making Table 3-5 on pages 54 and 55 in the User's Guide incorrect. The table below labeled Table 3-5 provides the correct information.

5.3 SCAMS Corrections to the User's Guide

The information contents of the image in the swath displays for SCAMS has been changed since launch, making Tables 4-5, 4-6, and 4-7 in the User's Guide incorrect. Thus, the table below labeled Table 4-5 and 6 replaces Tables 4-5 and 4-6 in the User's Guide, and the table labeled 4-7 replaces Table 4-7 in the User's Guide. All the images display the same parameters. Therefore, these new tables do not list all the possible displays, as were listed in the old Tables 4-5, 4-6, and 4-7.

Section 4.5.3 "Tape Format" on page 83 of the User's Guide states that each tape will have "five files, i.e., a short header file . . . and four data files,. . ." There will not be a header file on the archival tape. The sentence should be changed to read: "The tapes will be standard 9-track 1600 BPI tapes, each containing four data files, one for each of four days."

Table 5-1

This table replaces Table 3-5 on pages 54 and 55 in The Nimbus 6 User's Guide

Table 3-5

Temperature Range of Gray Scale, and Channel of HIRS Data for each Swath on each HIRS Image Display between Orbit 426 and 1082 (14 July through 31 August 1975)

		SWATH NUMBER									
		1	2	3	4	5	6	7	8	9	10
Coverage Period 14 July-20 July Orbits 426-513	HIRS Channel Display (channel-range)*	08-08	09-09	10-10	16-16	17-17	18-18	12-12	14-14	03-03	15-15
	Temperature Range (°K) (black to white)	300-200	290-210	260-210	310-270	100-900	0-30	290-210	260-210	240-210	280-210
Coverage Period 22 July-31 July Orbits 538-545 548-549 600-613 615-647 651-657 659	HIRS Channel Display (channel-range)*	08-08	09-09	10-10	16-16	17-17	17-17	12-12	14-14	03-03	15-15
	Temperature Range (°K) (black-white)	300-200	290-210	260-230	310-270	100-900	100-900	280-200	280-200	280-200	280-200
Coverage Period 23 July-6 Aug. Orbits 546-547 553-599 614 648-650 658 660-747	HIRS Channel Display (channel-range)*	08-08	16-16	16-21	18-18	17-17	10-10	12-12	14-14	03-03	15-15
	Temperature Range (°K) (black-white)	300-200	310-270	300-200	0-30	100-900	260-230	280-200	280-200	280-200	280-200

Table 3-5 (Continued)

		SWATH NUMBER									
		1	2	3	4	5	6	7	8	9	10
Coverage Period 7 Aug.-31 Aug. Orbits 748-1082	HIRS Channel Display (channel-range)*	08-08	16-16	16-21	18-18	17-17	10-10	12-12	14-14	03-03	15-15
	Temperature Range (°K) (black-white)	310-230	310-230	310-270	0-50	100-900	280-210	300-210	300-210	240-185	300-185

*The HIRS channel number is number before the hyphen. The number after the hyphen is the computer program table used to display the data from each channel as temperatures (°K). The range of temperatures displayed in each swath is given beneath each "HIRS Channel Display." The 18 steps of the gray scale are used to represent the division of each temperature range into 18 approximately equal temperature intervals. The central wavelength (in μm) of each channel on these displays is: channel 3 = 14.4, 8 = 11.0, 9 = 8.2, 10 = 6.7, 12 = 4.52, 14 = 4.40, 15 = 4.24, 16 = 3.71, 17 = 0.61, and 18 is the temperature difference between channel 16 and channel 8. The values of channel 17-17 are albedo, represented as "counts" between 100 (blackest) and 900 (whitest). The values for 16-21 represent a second temperature range for channel 16 data. Table 3-1 on page 39 of the User's Guide provides detailed spectral information and the purpose of each of the HIRS channels.

Table 5-2

This table replaces Tables 4-5 and 4-6 (on pages 79 through 81) in The Nimbus 6 User's Guide

Table 4-5 and 6

Parameter Value for each Step of the Gray Scale on the SCAMS Image Displays for Parameters 2, 3, 11, 12 and 16 (valid between orbit 426, 14 July, and orbit 1082, 31 August 1975)

Gray Scale Number	Parameters					
	2 (31.65 GHz T_A) (°K)	3 (52.85 GHz T_A) (°K)	11 (Integrated water vapor) (g/mm^2)	12* (Integrated liquid water) (g/mm^2)	12** (Integrated liquid water) (g/mm^2)	16 (param. 2) minus (param. 3) (°K)
(black) 1	> 320	> 280	> 60	> 1.6	> 1.5	> 10
2	306 - 320	276 - 280	56 - 60	1.5 - 1.6	1.4 - 1.5	08 - 10
3	293 - 306	271 - 276	53 - 56	1.4 - 1.5	1.3 - 1.4	06 - 08
4	279 - 293	267 - 271	49 - 53	1.3 - 1.4	1.2 - 1.3	04 - 06
5	265 - 279	263 - 267	45 - 49	1.2 - 1.3	1.1 - 1.2	02 - 04
6	251 - 265	258 - 263	41 - 45	1.1 - 1.2	1.0 - 1.1	00 - 02
7	238 - 251	254 - 258	38 - 41	1.0 - 1.1	0.9 - 1.0	-02 - 00
8	224 - 238	249 - 254	34 - 38	0.9 - 1.0	0.8 - 0.9	-04(-) - 02
9	210 - 224	245 - 249	30 - 34	0.8 - 0.9	0.7 - 0.8	-06(-) - 04
10	196 - 210	241 - 245	26 - 30	0.7 - 0.8	0.6 - 0.7	-08(-) - 06
11	183 - 196	236 - 241	23 - 26	0.6 - 0.7	0.5 - 0.6	-10(-) - 08
12	169 - 183	232 - 236	19 - 23	0.5 - 0.6	0.4 - 0.5	-12(-) - 10
13	155 - 169	228 - 232	15 - 19	0.4 - 0.5	0.3 - 0.4	-14(-) - 12
14	141 - 155	223 - 228	11 - 15	0.3 - 0.4	0.2 - 0.3	-16(-) - 14
15	128 - 141	219 - 223	08 - 11	0.2 - 0.3	0.1 - 0.2	-18(-) - 16
16	114 - 128	214 - 219	04 -08	0.1 - 0.2	0.0 - 0.1	-20(-) - 18
17	100 - 114	210 - 214	00 - 04	0.0 - 0.1	-0.1 - 0.0	-22(-) - 20
(white) 18	< 100	< 210	< 00	< 0.0	< -0.1	< -22

*valid between orbits 426 and 477

**valid between orbits 478 and 1082

Table 5-3
This table replaces Table 4-7 (on pages 82 and 83)
in The Nimbus 6 User's Guide

Table 4-7

Contour Program Options used for Parameters 13, 14, and
15 on the SCAMS Image Displays

Contour options	Parameters 13 Mean temperature between 1000 mb and 500 mb	14 Mean temperature between 500 mb and 250 mb	15 Mean temperature between 250 mb and 100 mb	Valid for orbits
Contour interval	4°K	4°K	4°K	426-851 (14 July-14 August)
Contour thickness	1°K	1°K	1°K	
Contour interval	4°K	4°K	4°K	852-1082 (14 August-31 August)
Contour thickness	2°K	2°K	2°K	

In Table 4-8 on page 80 the "Pitch error" and "Roll error" "Dimensional Units" should be changed to counts (from Deg) and the "Multiplier Used" should be changed to 1 (from 32). In the same table the "Playback orbit" should be followed by one "I*2 Spare", and then by the "Reference orbit", which should be changed to I*4 (rather than I*2). (Reference orbit = year * 100,00 + day * 100+finish hour.) The "Dimensional Units" for the "Geopotential thicknesses" on page 85 of the same table should be changed to "°K" (from DM).

The following information, describing how the antenna temperatures are computed from the SCAMS instrument digital data, should be added after SCAMS Section 4.5 of the User's Guide.

4.6 Post-launch Calibration

Antenna temperatures are computed from the SCAMS instrument digital data for each of the five channels by the equation

$$T_A = T_{AS} + \frac{T_{AC} - T_{AS}}{d_c - d_s}(d - d_s)$$

where T_A is antenna temperature for the earth (positions 0-12), T_{AS} is the space antenna temperature (position 13), T_{AC} is the calibration target antenna temperature (position 14), d is earth data in counts, d_s is space data in counts, and d_c is calibration target data in counts. The digital data matrix is described in Table 4-2 of the Nimbus 6 User's Guide. The space calibration antenna temperature is assumed constant at 3°K for all five channels. The target antenna temperature is computed by

$$T_{AC} = T_C + T_{CO}$$

The constant offset T_{CO} is currently assumed to be zero for all channels, and the target temperatures (T_C) are given by

$$T_C = a_0 + a_1 (R - R_{25}) + a_2 (R - R_{25})^2$$

where the thermistor resistances (R) are computed by

$$R = R_1 + \frac{R_2 - R_1}{d_{R2} - d_{R1}} (d_R - d_{R1})$$

and values of the other constants are listed in Table 4-9. Note that channels 3, 4, and 5 share the same calibration target. Also listed in Table 4-9 are word numbers in the digital data matrix containing data values d_R, d_{R1}, and d_{R2}.

5.4 ESMR Corrections to the User's Guide

The following are corrected equations for the ESMR Section of the User's Guide:

page 90

$$X \text{ (km)} = (636 + 10.8P = 0.32P^2)\, R_j$$

page 96

$$T_B = T_A - (T_A - T_C)\, \frac{(C - C_A)}{(C_C - C_A)}$$

page 101

$$T_{\substack{\text{Horizontal}\\ \text{True}}} = 1 + a\, T_{\substack{\text{Horizontal}\\ \text{Nominal}}} - T_{\substack{\text{Vertical}\\ \text{Nominal}}}$$

Table 5-4

This table accompanies Section 4.6 "Post-launch Calibration", and should be added to the end of the SCAMS section of the User's Guide.

Table 4-9

Thermistor Calibration Constants
used to Calculate the SCAMS Target Temperatures

constant \ channel	1	2	3,4,5
a_0		298.16	
a_1	.46485	.46535	.46814
a_2	$3.0 \cdot 10^{-5}$	$2.9 \cdot 10^{-5}$	$3.0 \cdot 10^{-5}$
R_{25}	603.75	602.98	599.71
R_1		495.6	
R_2		603.4	
d_R (word no.)	1	11	2
d_{R1}(word no.)	61		62
d_{R2}(word no.)	71		72

$$T_{\substack{\text{Vertical}\\ \text{True}}} = 1 + b\, T_{\substack{\text{Vertical}\\ \text{Nominal}}} - b\, T_{\substack{\text{Horizontal}\\ \text{Nominal}}}$$

page 106

$$N_i = 256\ (T_{Hi} - 100) + T_{Vi} - 100$$

The following information supplements Section 5.3.2 in the User's Guide.

The display format and temperature ranges of the images in the swath displays for ESMR has been changed since launch. Only the full vertical scale (SCALE-F) is used, and its format has been changed to provide a better aspect ratio to each image. Each scan line of ESMR data is displayed twice (rather than once, as stated on the last line on page 103 of the User's Guide) and each of the 71 scan-spot elements across a scan is only displayed once (rather than twice, as stated on line three on page 104 of the User's Guide).

By displaying each of the 71 scan-spot elements only once the width of each swath is half the planned width. Therefore, the display format now contains 20 swaths in two groups of ten, each with its own TIME (and) SUBPOINT line. Each group of ten contains the same geographic coverage. The swaths within each group contain different temperature and polarization information. However, the temperature and polarization information for each group is similar. That is, the range of temperatures and the polarization for swath 1 is the same as for swath 11; similarly, swaths 2 and 12 are the same, etc. The swaths are not labeled, as planned. On these displays swath number 1 is on the far left, with numbers incrementing to swath number 20 on the far right. The tables here labeled 5-5 and 5-5a replace Table 5-5 on page 105 of the User's Guide. The new tables give the new brightness temperature values versus steps of the gray scale for each of the 20 swaths.

The ten swaths on the right half of each display show the earliest recorded data, and the ten on the left half show the latest recorded data. If the right set of ten swaths were cut and placed above the left set, the modified display would show the continuous coverage recorded for that orbit.

5.5 ERB Corrections to the User's Guide

Post-launch calibration procedures are described below. While some numbers are for the period of this catalog, the calibration procedure is valid for all data. This information can be added as Section 6.5a to the User's Guide and would fit on page 134.

6.5a Post-launch Calibration

The observations from the wide-angle channels (11 and 12), which measure the total energy ($< 0.2\ \mu$m to $> 50\ \mu$m) emitted and reflected by the earth, depend on the prelaunch calibration and pertinent instrument temperatures. Assuming unit emissivity for the target scene, the irradiance from the scene is given by,

$$H_T = [\Delta W - \epsilon_s F_s \sigma T_s^4 + \epsilon_d F_d \sigma (T_d + K v)^4]$$

where

ΔW = effective thermopile irradiance (w m^{-2})

$\sigma = 5.6697 \times 10^{-8}$ w m^{-2} (deg. K)$^{-4}$

ϵ_s = emissivity of FOV stop = 0.965

F_s = view factor of the FOV stop = 0.18892

T_s = temperature (°K) of the FOV stop

Table 5-5

This table replaces Table 5-5 on page 105 in the User's Guide

Table 5-5

Brightness Temperature Value for each Step of the Gray Scale on ESMR Image Displays for Orbits 426 through 827 (14 July through 12 August 1975)

Gray Scale Number	Swath Number and ESMR Display Parameter									
	1 and 11 (T_H)	2 and 12 (T_V)	3 and 13 $\frac{T_H+T_V}{2}$	4 and 14 (T_H)	5 and 15 (T_V)	6 and 16 $\frac{T_H+T_V}{2}$	7 and 17 (T_H)	8 and 18 (T_V)	9 and 19 $\frac{T_H+T_V}{2}$	10 and 20 (T_V-T_H)
(black) 1	> 200			> 250			> 300			> 50
2	196-200	same	same	246-250	same	same	296-300	same	same	46-50
3	193-196	as	as	243-246	as	as	293-296	as	as	43-46
4	190-193	1 and 11	1 and 11	240-243	4 and 14	4 and 14	290-293	7 and 17	7 and 17	40-43
5	187-190			237-240			287-290			37-40
6	184-187			234-237			284-287			34-37
7	181-184			231-234			281-284			31-34
8	178-181			228-231			278-281			28-31
9	175-178			225-228			275-278			25-28
10	171-175			221-225			271-275			21-25
11	168-171			218-221			268-271			18-21
12	165-168			215-218			265-268			15-18
13	162-165			212-215			262-265			12-15
14	159-162			209-212			259-262			09-12
15	156-159			206-209			256-259			06-09
16	153-156			203-206			253-256			03-06
17	150-153			200-203			250-253			00-03
(white) 18	< 150			< 200			< 250			< 00

T_H = Brightness temperature derived from the ESMR horizontal polarization channel data

T_V = Brightness temperature derived from the ESMR vertical polarization channel data

Table 5-6
This table follows the new Table 5-5 (above), which replaced
Table 5-5 on page 105 in the User's Guide

Table 5-5a

Brightness Temperature Value for each Step of the Gray Scale on ESMR Image Displays
for Orbits 828 through 1082 (13 August through 31 August 1975)
(Brightness Temperatures are in °K)

Gray Scale Number	Swath Number and ESMR Display Parameter									
	1 and 11 (T_H)	2 and 12 (T_V)	3 and 13 $\frac{T_H+T_V}{2}$	4 and 14 (T_H)	5 and 15 (T_V)	6 and 16 $\frac{T_H+T_V}{2}$	7 and 17 (T_H)	8 and 18 (T_V)	9 and 19 $\frac{T_H+T_V}{2}$	10 and 20 (T_V-0.6T_H)
(black) 1	> 200	> 230	> 210	> 250	> 270	> 250	> 290	> 300	> 280	> 140
2	196-200	226-230	206-210	246-250	267-270	247-250	287-290	298-300	278-280	136-140
3	191-196	223-226	203-206	243-246	264-267	244-247	284-287	295-298	275-278	133-136
4	187-191	219-223	199-203	239-243	261-264	241-244	281-284	293-295	273-275	129-133
5	183-187	215-219	195-199	235-239	258-261	238-241	278-281	290-293	270-273	125-129
6	178-183	211-215	191-195	231-235	254-258	234-238	274-278	288-290	268-270	121-125
7	174-178	208-211	188-191	228-231	251-254	231-234	271-274	285-288	265-268	118-121
8	169-174	204-208	184-188	224-228	248-251	228-231	268-271	283-285	263-265	114-118
9	165-169	200-204	180-184	220-224	245-248	225-228	265-268	280-283	260-263	110-114
10	161-165	196-200	176-180	216-220	242-245	222-225	262-265	278-280	258-260	106-110
11	156-161	193-196	173-176	213-216	239-242	219-222	259-262	275-278	255-258	103-106
12	152-156	189-193	169-173	209-213	236-239	216-219	256-259	273-275	253-255	99-103
13	148-152	185-189	165-169	205-209	233-236	213-216	253-256	270-273	250-253	95-99
14	143-148	181-185	161-165	201-205	229-233	209-213	249-253	268-270	248-250	91-95
15	139-143	178-181	158-161	198-201	226-229	206-209	246-249	265-268	245-248	88-91
16	134-139	174-175	154-158	194-198	223-226	203-206	243-246	263-265	243-245	84-88
17	130-134	170-174	150-154	190-194	220-223	200-203	240-243	260-263	240-243	80-84
(white) 18	< 130	< 170	< 150	< 190	< 220	< 200	< 240	< 260	< 240	< 80

T_H = Brightness temperature derived from the ESMR horizontal polarization data

T_V = Brightness temperature derived from the ESMR vertical polarization data

ϵ_d = emissivity of the thermopile = 0.977

F_d = view factor of the thermopile = 0.80461

T_d = temperature (°K) of the thermopile base

K = factor relating thermopile base temperature to thermopile surface temperature = 0.0031°K per count

v = thermopile output in digital counts

The effective thermopile irradiance (ΔW) is obtained from the thermopile output (v) as follows:

$$\Delta W = a_o\ (T_m) + a_1\ (T_m) \cdot v$$

where

$$a_o = C_o + C_1\ T_m,$$

and

$$a_1 = d_o + d_1\ T_m$$

are derived from prelaunch calibrations and depend on the module temperature (T_m, °C). The coefficients C_o, C_1, d_o, d_1 are given below. In calibrating channel 11 and channel 12 (W) with the FOV stop out, the quantity F_s in the equation for H_T is set to zero.

	Ch. 11	Ch. 12 (W)	Ch. 12 (N)
C_o:	9.86	10.4	8.38
C_1:	0.18358	0.23235	0.18483
d_o:	0.6042	0.6035	0.6014
d_1:	-8.254×10^{-4}	-6.109×10^{-4}	-5.879×10^{-4}

The observations from the other two wide-angle channels (13 and 14), which measure the shortwave radiation (0.2 μm to 4.0 μm), and (0.7 μm to 3.0 μm), are transformed to irradiance (H) by,

$$H = \frac{(V-V_o)}{S_T}$$

where V is the digital counts, V_o is the offset (in counts) observed from dark FOV's, and S_T is the sensitivity (w m^{-2} $count^{-1}$) obtained from the equation: $S_T + S_o(1+(0.01) \cdot (T-25) \cdot STC)$, where S_o is the sensitivity at 25°C, T is the detector temperature (°C), and STC is the sensitivity temperature coefficient (percent per degree C). These constants are given below:

Ch	V_o	S	STC
13	-41	2.004	0.04
14	-44	3.989	0.03

The interpretation of digital counts (V) from the shortwave scanning channels (15-18) gives the radiance (w m^{-2} sr^{-1}) of the scene (N_s) by,

$$N_s = \frac{(V-V_o)}{S_T}$$

where V_o is the offset (counts) obtained during views of the internal blackbody or space. The sensitivity S_T at temperature T(°C) is obtained using the equation for S_T described above, and the constants given below.

Ch	V_o	S	STC
15	-3	3.155	0.0
16	0	3.275	0.03
17	-1	3.116	-0.01
18	15	2.963	-0.05

A series of checks on the sensitivity of these channels, using the on-board diffuse target, indicated no noticeable degradation over the July-August period of operation.

The longwave scanning channels (19-22) have had numerous inflight calibrations which have remained essentially unchanged since 3 July. The calibration coefficients, a_o and a_1 relate digital counts (V) to the scene radiance N (w m^{-2} sr^{-1}) as follows:

$$N_s = N_m + a_o + a_1 \cdot V$$

where N_m is the radiance of the detector module. The radiance N_s is the actual radiance measured within the spectral limits of the filter (4.5 μm to 50 μm). The calibration coefficients, obtained from inflight calibrations on 3 July, are as follows:

Ch	a_o	a_1
19	-0.82	0.09583
20	-0.60	0.10535
21	-1.26	0.10168
22	-0.29	0.10338

The deviations of these calibration coefficients as derived from inflight calibrations from 29 July to 20 August are shown in Table 6-6a. The only change which indicates a need for updating the calibration coefficients is the change in the intercept of channel 20.

Periodic checks of the electronic gains of channels 1 through 14 have shown that the electronic gains have remained within 0.5 percent of the prelaunch values, with few exceptions. Table 6-6b shows the percentage of maximum deviation in the gain ratios (current/prelaunch) for the three steps in the calibration staircase voltage. The 6.5 percent change in the high-level gain of channel 2 and the gain changes in channels 6, 7, and 8 are believed to be caused by radio-frequency interference with the electronic calibration circuit and is neither a real change in the electronic gain nor nonlinearities of the channels.

Table 5-7

This table is part of the new Section 6. 5a "Post-launch Calibration" to be added to the ERB section of the User's Guide

Table 6-6a

Stability of Calibration of the
ERB Longwave Scanning Channels
(between 29 July and 20 August 1975)

	Channel 19		Channel 20		Channel 21		Channel 22	
Date	Δa_o	Δa_1	Δa_o	Δa_1	Δa_o	Δa_1	Δa_o	Δa_1
7/29	-0. 07	-0. 4	1. 12	0. 5	-0. 07	-0. 4	0. 36	-0. 3
8/5	0. 50	-0. 3	1. 22	0. 1	0. 08	-0. 3	0. 11	-0. 2
8/8	0. 68	-0. 4	1. 33	0. 1	0. 04	-0. 2	-0. 003	-0. 1
8/12	-0. 06	-0. 2	0. 74	-0. 4	-0. 09	-0. 3	0. 17	-0. 2
8/17	0. 69	-0. 3	1. 49	0. 2	0. 20	-0. 3	0. 16	-0. 2
8/20	-0. 22	-0. 3	1. 53	0. 2	0. 04	-0. 2	0. 13	-0. 4

Δa_o = change in intercept ($w\ m^{-2}\ sr^{-1}$)

$= (a_o)_{current} - (a_o)_{7/3/75}$

Δa_1 = change in slope ($\%\ w\ m^{-2}\ sr^{-1}\ ct^{-1}$)

$$= \frac{[(a_1)_{current} - (a_1)_{7/3/75}]}{(a_1)_{7/3/75}} \times 100$$

Table 5-8

This table is part of the new Section 6.5a "Post-launch Calibration" to be added to the ERB section of the User's Guide

Table 6-6b

Percentage Change of the Maximum Deviation in the Gain Ratio between Post-launch and Prelaunch Gain Values for ERB channels 1 through 14 (20 June and 17 August 1975)

Ch	G_{0-39}	G_{30-60}	G_{60-90}
1	-0.2	0.2	-0.1
2	0.1	-0.3	-6.5
3	±0.1	-0.1	-0.2
4	±0.1	-0.2	-0.1
5	±0.1	-0.2	0.2
6	2.6	1.8	-2.1
7	1.3	2.1	-0.6
8	1.6	1.3	-0.9
9	0.4	-0.6	±0.1
10	0.7	-0.5	±0.2
11	-0.4	0.3	0.4
12	0.2	-0.2	0.4
13	-0.3	0.2	0.3
14	+0.2	-0.1	0.3

Table 6-7, the ERB Compacted Archival Tape Format, on pages 136 through 139 of the User's Guide, should be changed as follows:

Directory Record (Page 136)

Delete last line of section A which reads:

"135-340 Zero fill 1"

and add the following:

135-149	Orbital Elements	
135	Day of Epoch	1
136	Year of Epoch	1
137	Hours	1
138	Minutes (including fraction)	100
139	Eccentricity	10^5
140	Argument of Perigee (integer part)	1
141	Argument of Perigee (fraction part)	10^3
142	Right Ascension (integer part)	1
143	Right Ascension (fraction part)	10^3
144	Inclination (integer part)	1
145	Inclination (fraction part)	10^3
146	Semimajor Axis (km, integer part)	1
147	Semimajor Axis (km, fraction part)	10^3
148	Mean Anomaly (integer part)	1
149	Mean Anomaly (fraction part)	10^3
150	Sun-Earth Distance (A. U.)	10^4
151-340	Zero fill	1

Orbital Summary Record (Page 139)

Delete last line of table, which reads:

17-340 Zero fill 1"

and add the following:

17-26	Solar Irradiances (Chs. 1-10) Normalized to mean sun-earth distance	Chs. 1-5:10 Chs. 6-10:100
27	Solar Channels Assembly Gamma Angle (positive to right of track)	1
28-340	Zero fill	1

5.6 LRIR Corrections to the User's Guide

Table 5-9

Post-launch analysis of relative spectral response data and orbital data leads to the following corrected values for Table 7-2, on page 154 of the User's Guide.

Table 7-2

Optical Characteristics of LRIR Channels

Channel No.	Channel Abbrev.	Band Pass (50% Peak Response)	Field-of-view (km) Vertical	Field-of-view (km) Horizontal	Random noise in orbit* $\pm 1\sigma$(watts/m^2-sr)
1	NCO_2	649-672 cm^{-1} (14.9-15.4 μm)	2.0	20	0.0023
2	BCO_2	592-700 cm^{-1} (14.3-16.9 μm)	2.0	20	0.0040
3	O_3	984-1169 cm^{-1} (8.6-10.2 μm)	2.0	20	0.011
4	H_2O	412-446 cm^{-1} (22.4-24.3 μm)	2.5	25	0.008

*Noise will gradually increase as the detector temperature increases during the useful life of the experiment.

5.7 PMR Corrections to the User's Guide

There are no PMR corrections to the User's Guide.

5.8 TWERLE Corrections to the User's Guide

Table 5-10

The following are address changes to Table 9-2
on page 186 in the User's Guide.

Table 9-2

Nimbus RAMS Experiments

Address Changes

OLD	NEW
Mr. G. R. Cresswell Division of Fisheries & Oceanography Commonwealth Scientific & Industrial Research Organization Melbourne, Australia	Mr. G. R. Cresswell Division of Fisheries & Oceanography CSIRO P. O. Box 21 Cronulla, N. S. W. 2230 Australia
A. J. Dyer CSIRO P. O. Box 77 Mordialloc, Vic 3195 Australia	Dr. A. J. Dyer Division of Atmospheric Physics CSIRO Station Street ASPENDALE 3195 Victoria, Australia
Professor Pierre Lacombe, Director Laboratory d'Oceanographic Museau Historie Naturelle de Paris 43 Rue Cuvier Paris, France	Professor Pierre Lacombe, Director Laboratoire d'Oceanographie Physique Museum National d'Histoire Naturelle 43-45 Rue Cuvier 75005 Paris, France
Professor P. Tchernia Museum d'Historie Naturelle de Paris 43 Rue Cuvier Paris, France	Professor P. Tchernia Laboratoire d'Oceanographie Physique Museum National d'Histoire Naturelle 43-45 Rue Cuvier 75005 Paris, France

Table 9-2 (Continued)

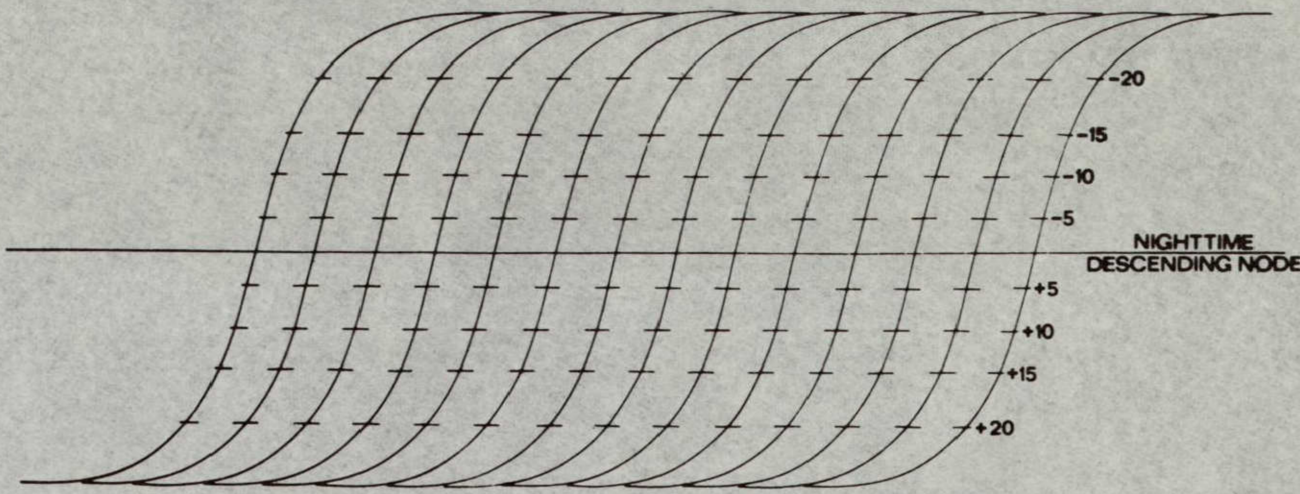
Dr. Norbert Untersteiner, Program Director Project AIDJEX 4059 Roosevelt Wave, N. E. Seattle, WA 98105	Dr. Norbert Untersteiner AIDJEX Coordinator University of Washington 4059 Roosevelt Way, N. E. Seattle, Washington 98105
Dr. Donald V. Hansen, Director Physical Oceanography AOWL NOAA U. S. Department of Commerce Miami, Florida	Dr. Donald V. Hansen, Director Physical Oceanography Laboratory AOML/NOAA 15 Rickenbacker Causeway Virginia Key Miami, Florida 33149
Vincent E. Lally National Center for Atmospheric Research P. O. Box 1470 Boulder, Colordao 80302	Mr. Vincent E. Lally National Center for Atmospheric Research P. O. Box 3000 Boulder, Colorado 80302
J. Lentfer Wildlife Research U. S. Department of Interior 813 D. Street Anchorage, Alaska	Mr. Jack W. Lentfer Fish and Wildlife Service Department of Interior 4454 Business Park Blvd. Anchorage, Alaska 99503
H. Brann Bureau of Meteorology Melbourne, Victoria Australia	Mr. H. N. Brann Bureau of Meteorology P. O. Box 1289K Melbourne, Victoria 3001 Australia
Robert Kee Development Engineering Division Code 6201 U. S. Naval Oceanographic Office Washington, D. C. 20390	Mr. Robert Kee Code 6220 U. S. Naval Oceanographic Office Washington, D. C. 20373

Table 9-2 (Concluded)

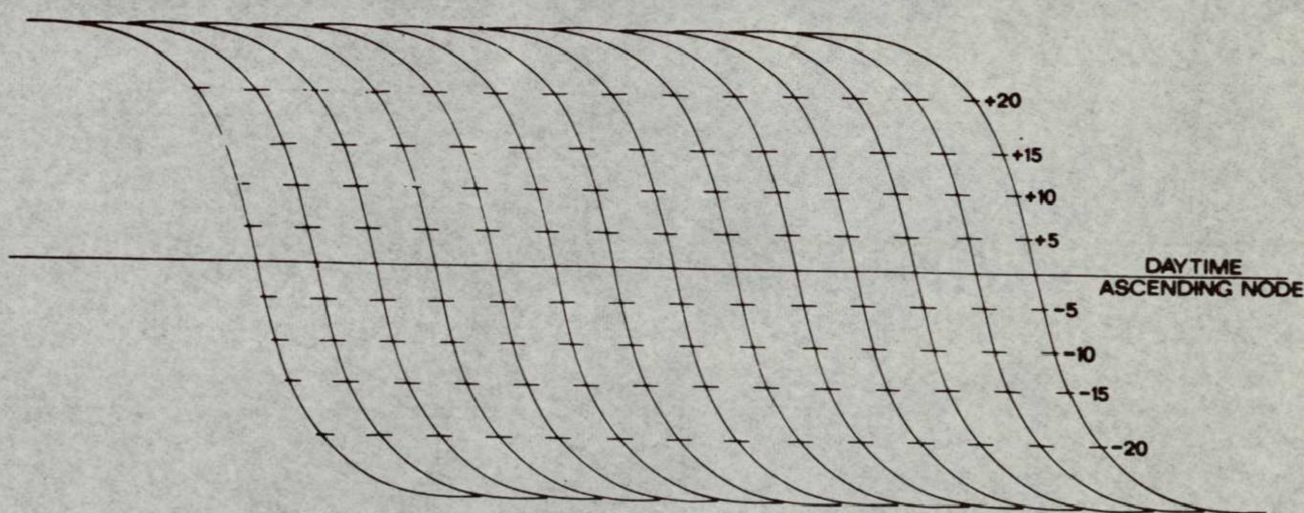
F. Anderson South African Council for Scientific & Industrial Research Congella, Natal, South Africa	Mr. Frank P. Anderson CSIR, Institute for Technology P. O. Box 17001 Congella 4013 South Africa
H. Stommel Professor of Oceanography MIT Cambridge, Massachusetts	Professor Henry Stommel Department of Meteorology Room 54-1416 Massachusetts Institute of Technology Cambridge, Massachusetts 02139
B. Buck Polar Research Lab. Santa Barbara California 93101	Mr. B. M. Buck, President Polar Research Laboratory, Inc. 123 Santa Barbara Street Santa Barbara, California 93101
John A. Knauss Graduate School of Oceanography University of Rhode Island Kingston, Rhode Island 02881	Dr. P. L. Richardson Woods Hole Ocean Institute Woods Hole, Massachusetts 02543

5.9 T&DRE Corrections to the User's Guide

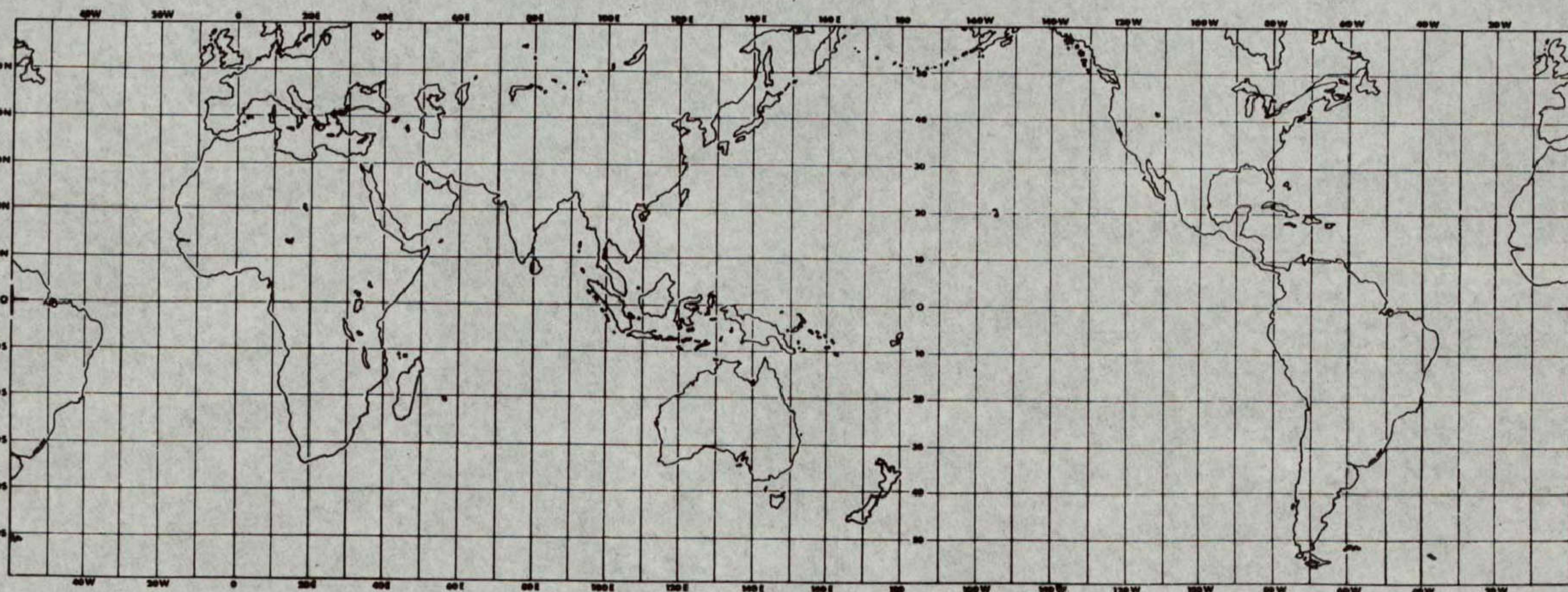
There are no T&DRE corrections to the User's Guide.



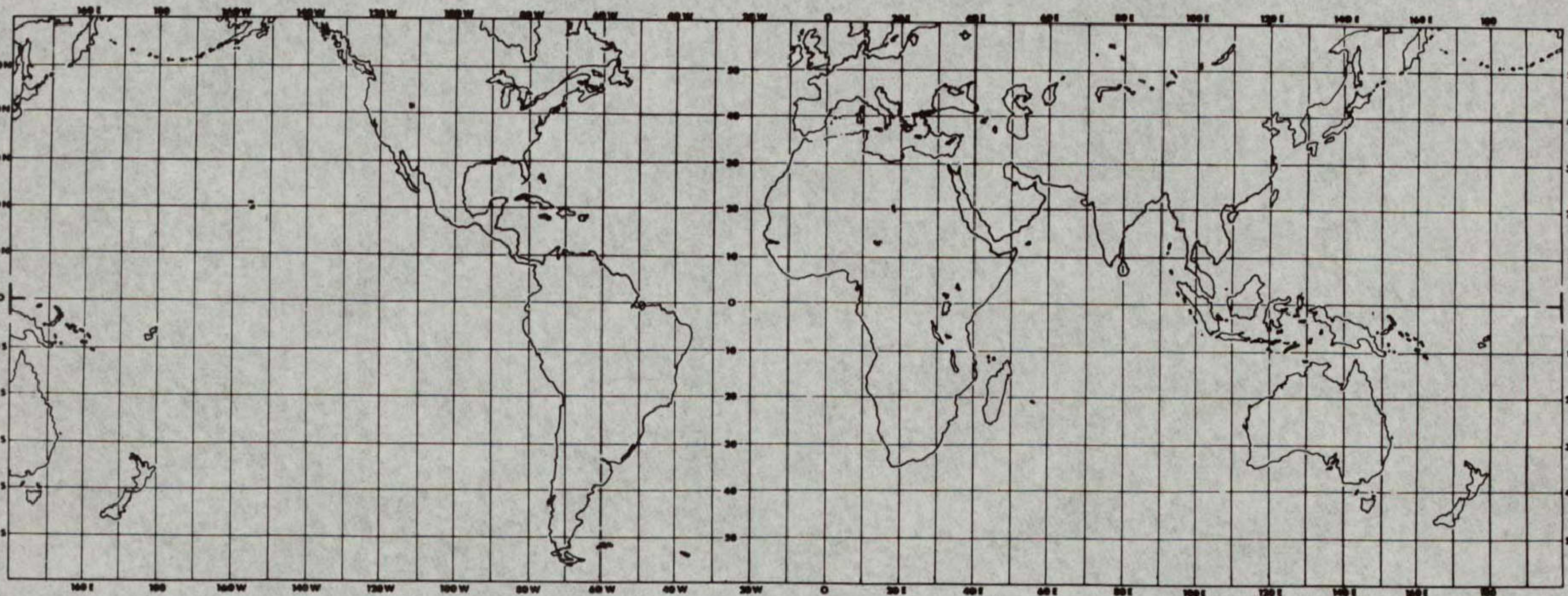
NIMBUS SUBSATELLITE TRACKS OVERLAY



NIMBUS SUBSATELLITE TRACKS OVERLAY



Location Guide
Average Scale for Nimbus
THIR Nighttime Montages



Location Guide
Average Scale for Nimbus
THIR Daytime Montages